4K92-20

ALASKA PENINSULA SALMON CATCH AND ESCAPEMENT SAMPLING

1992 OPERATIONAL PLANS

By:

Robert L. Murphy

Regional Information Report 4K92-20

Alaska Deparment of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

MAY 1992

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ALASKA PENINSULA CATCH SAMPLING PROCEDURES, 1992

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INTRODUCTION

The Alaska Peninsula and Aleutian Islands Management Areas commercial fishing area encompasses the Aleutian Islands, the North Alaska Peninsula west of Cape Menshikof, and the South Alaska Peninsula west of Kupreanof Point (Figures 1-8). There are 335 known salmon producing streams in the Aleutian Islands Area and 247 salmon producing streams in the Alaska Peninsula Area (Murphy 1992).

Five species of salmon are commercially harvested in the Alaska Peninsula and Aleutian Islands Management Areas: chinook, sockeye, pink, chum, and coho. Within the Alaska Peninsula and Aleutian Islands Management Areas, the majority of the catch is from local stocks. However, there three major interception fisheries. The first is in the South Unimak (Unimak District) and the Shumagin Islands fishery, where the June sockeye catch is predominantly fish migrating to Bristol Bay. The second interception fishery occurs in the Southeast Mainland area where the majority of the sockeye are migrating to the Chignik River system. Lastly, the area from Harbor Point to Strogonof Point had significant numbers of Bristol Bay origin sockeye in the catches as determined from scale pattern analysis (Swanton and Murphy 1992).

Economically, sockeye and pink salmon are usually the primary species in the South Alaska Peninsula while sockeye and chum salmon are usually the primary species in the North Alaska Peninsula and the Aleutian Islands. In some North Peninsula fisheries, chinook and coho salmon may be more economically important than chum salmon.

A basic function of fisheries management is to allow effort on stocks with harvestable surpluses while protecting those with returning runs below escapement requirements. Assignment of catch to river system of origin is a prerequisite for forecasting and evaluating escapement goals. Analysis of sockeye scale patterns can provide us with stock of origin information. In 1985, an expanded chinook, sockeye, chum, and coho salmon commercial catch sampling operation was initiated in the Alaska Peninsula Management Area for establishing a data base for separating stocks, evaluating escapement goals, forecasting, and assessing inseason run timing. The current emphasis is on sockeye and chum salmon.

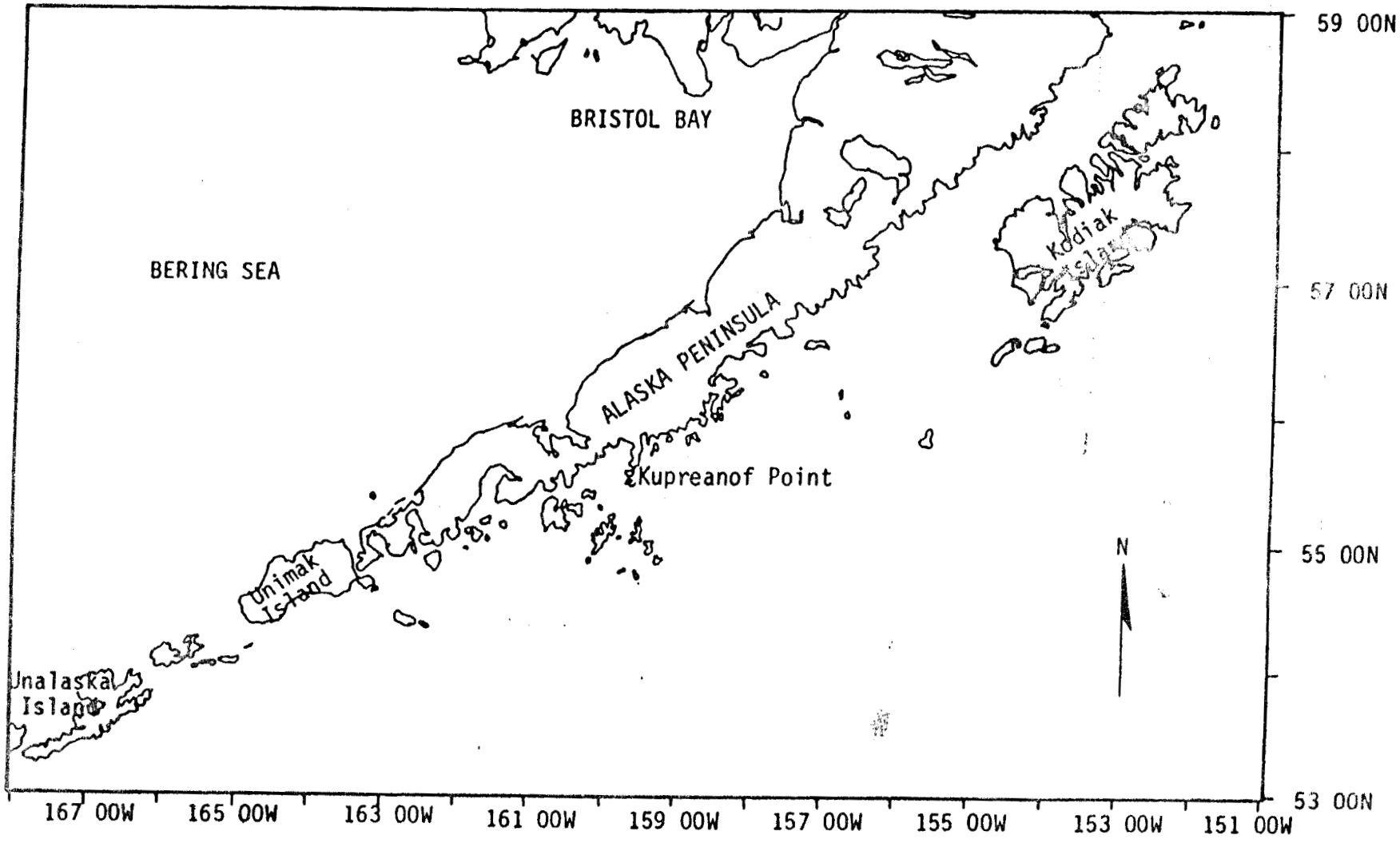


Figure 1. The Alaska Peninsula Management Area.

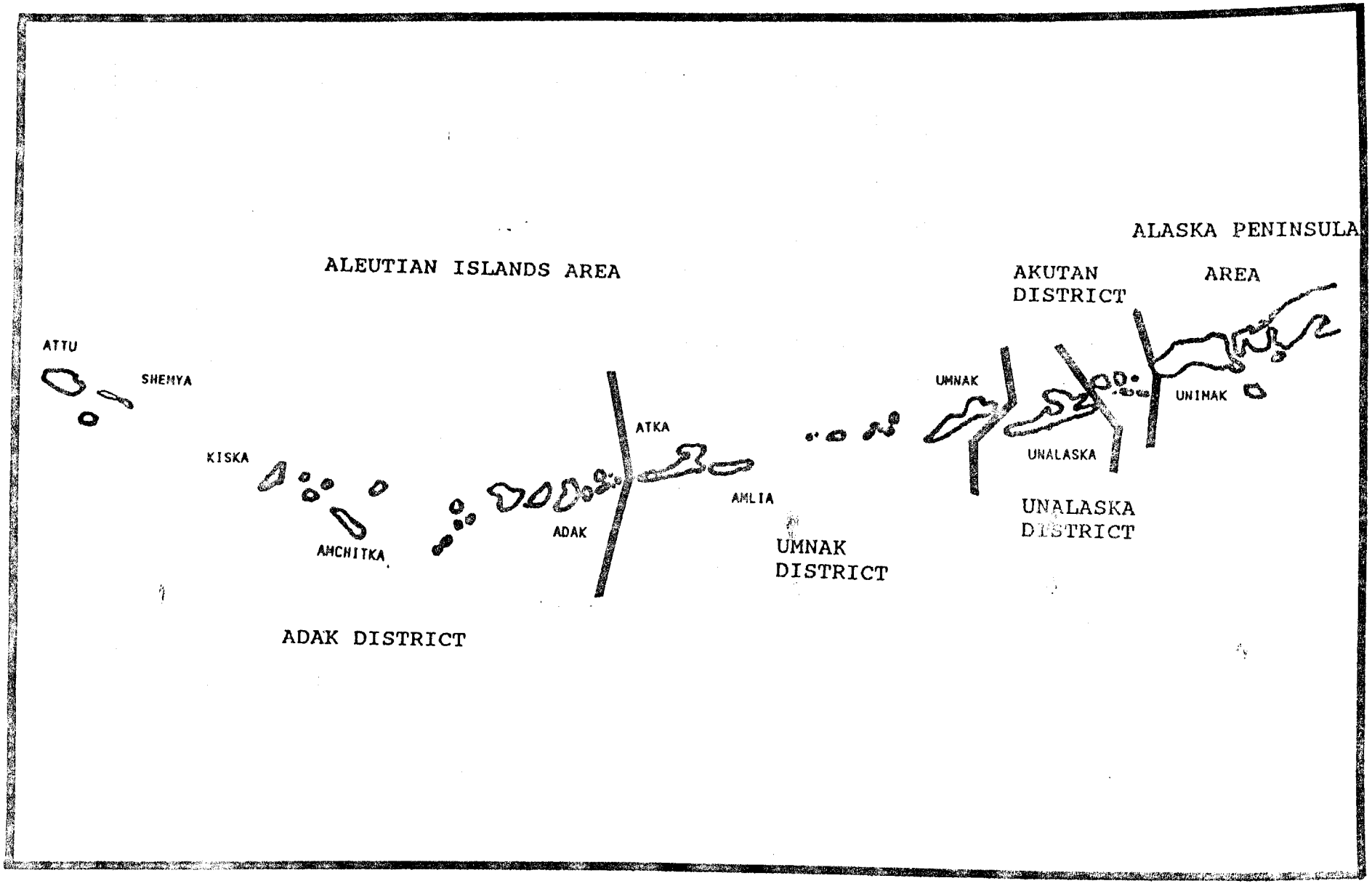


Figure 2. Aleutian Islands Management Area with districts shown.

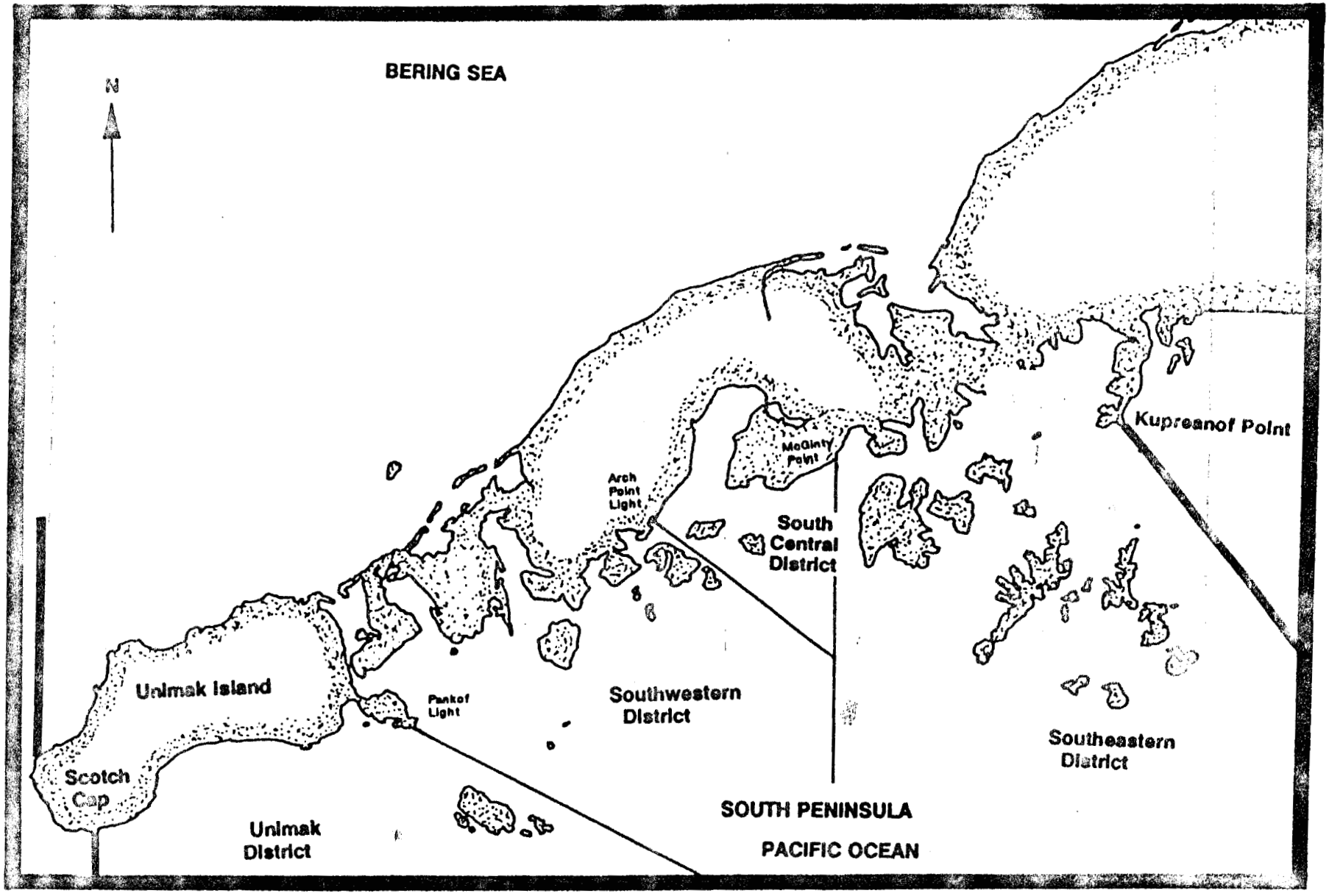


Figure 3. The South Peninsula Area from Kupreanof Point to Scotch Cap with districts shown.

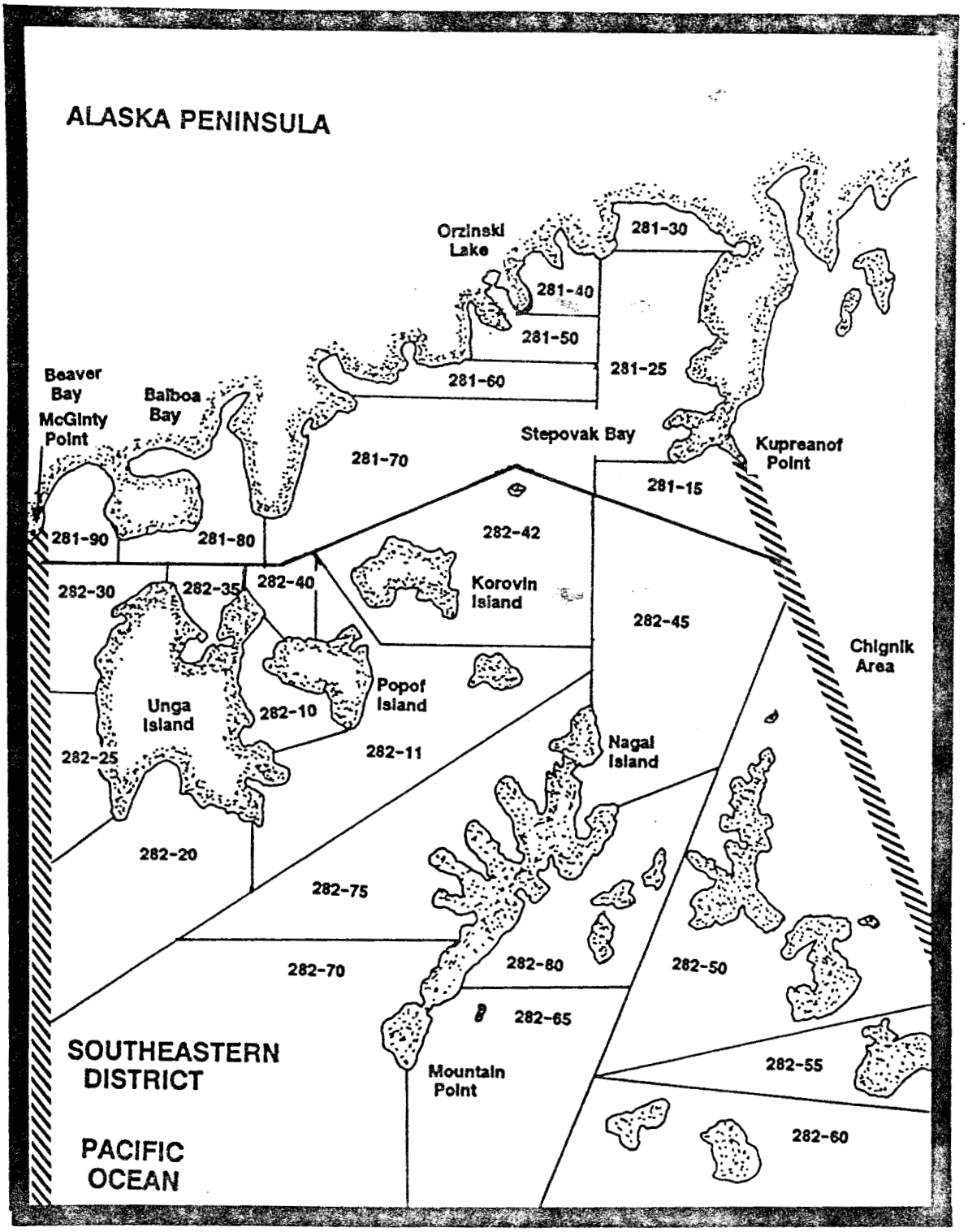


Figure 4. The Southeastern District with statistical areas shown.

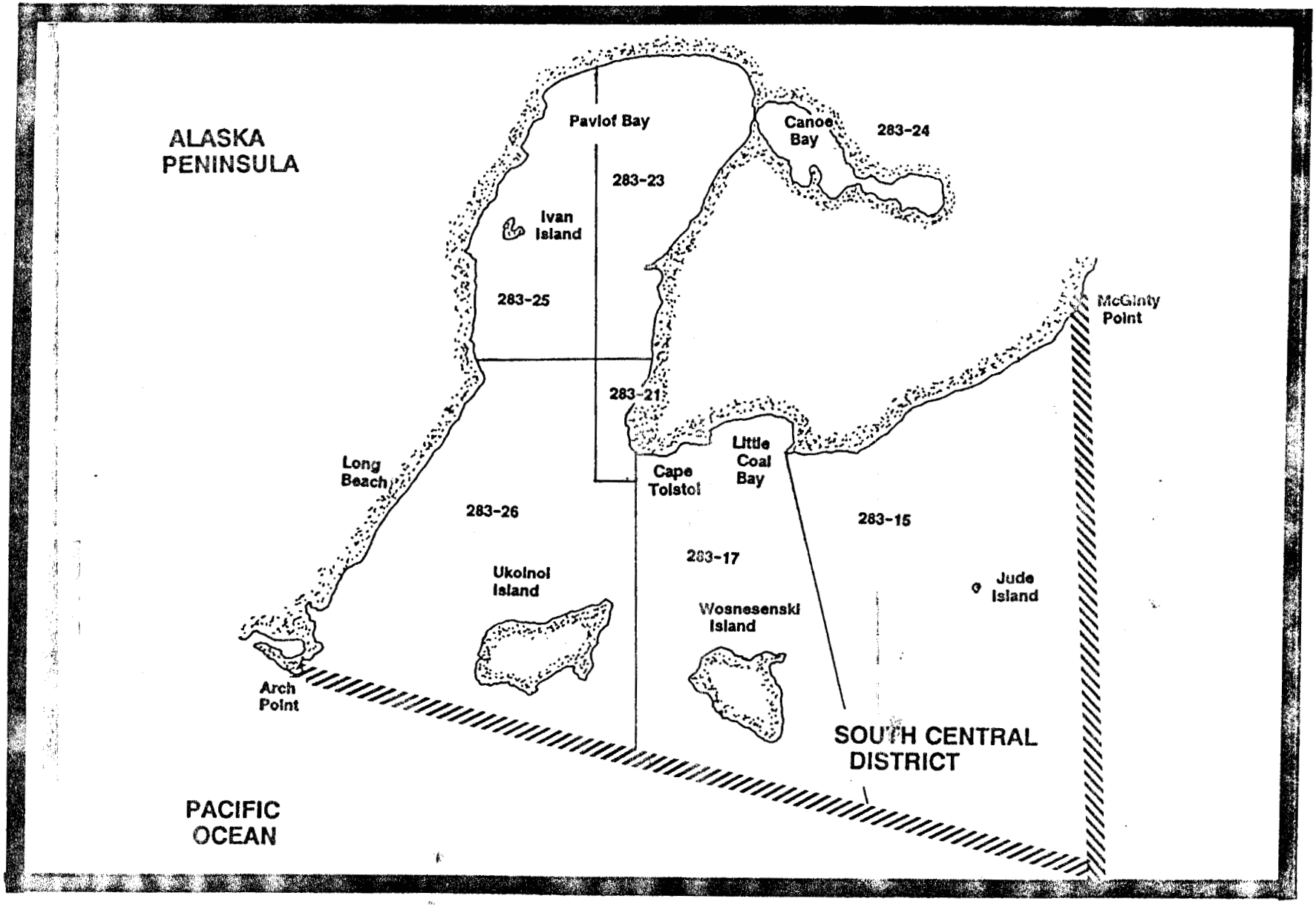


Figure 5. The South Central District with statistical areas shown.

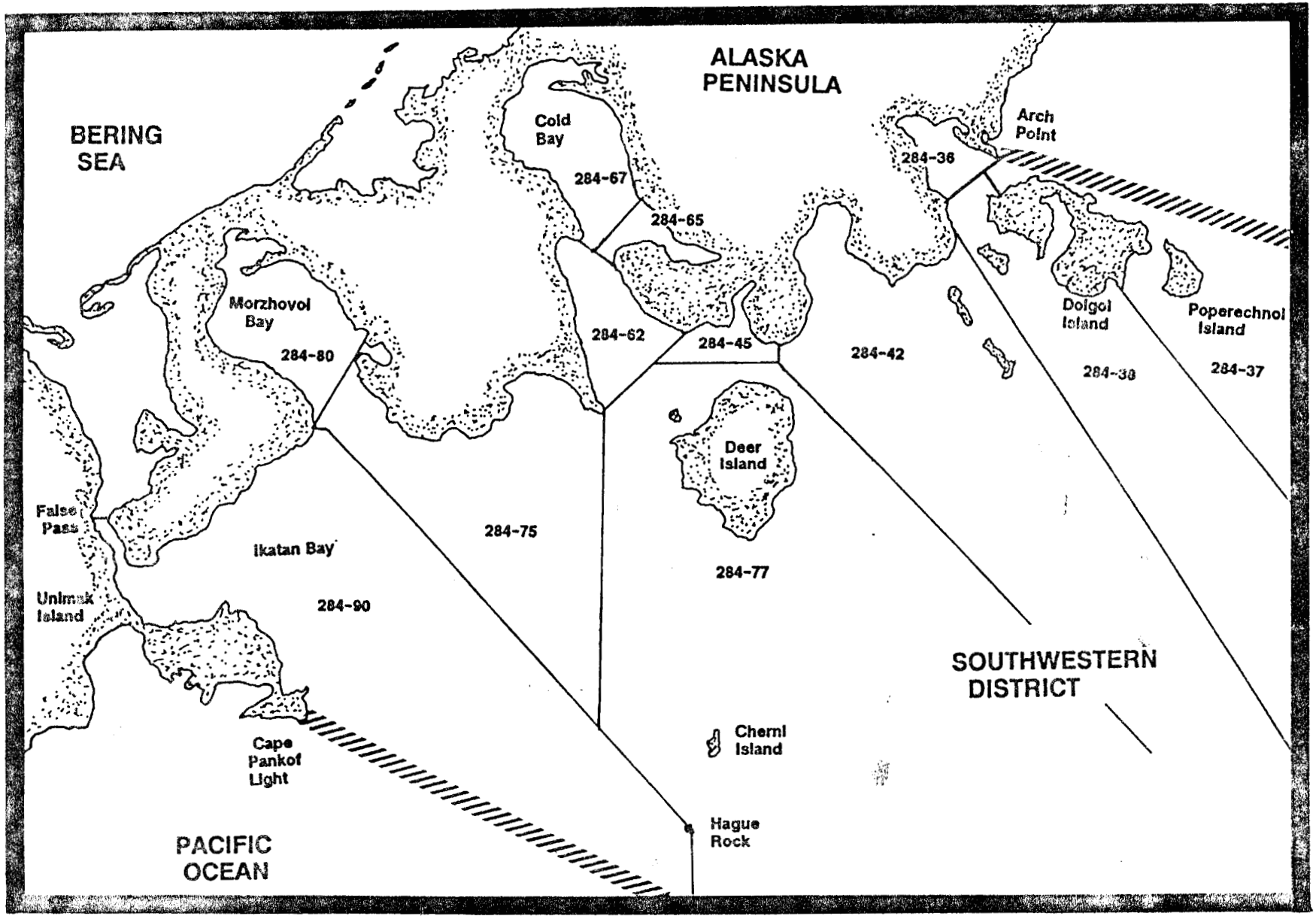


Figure 6. The Southwestern District with statistical areas shown.

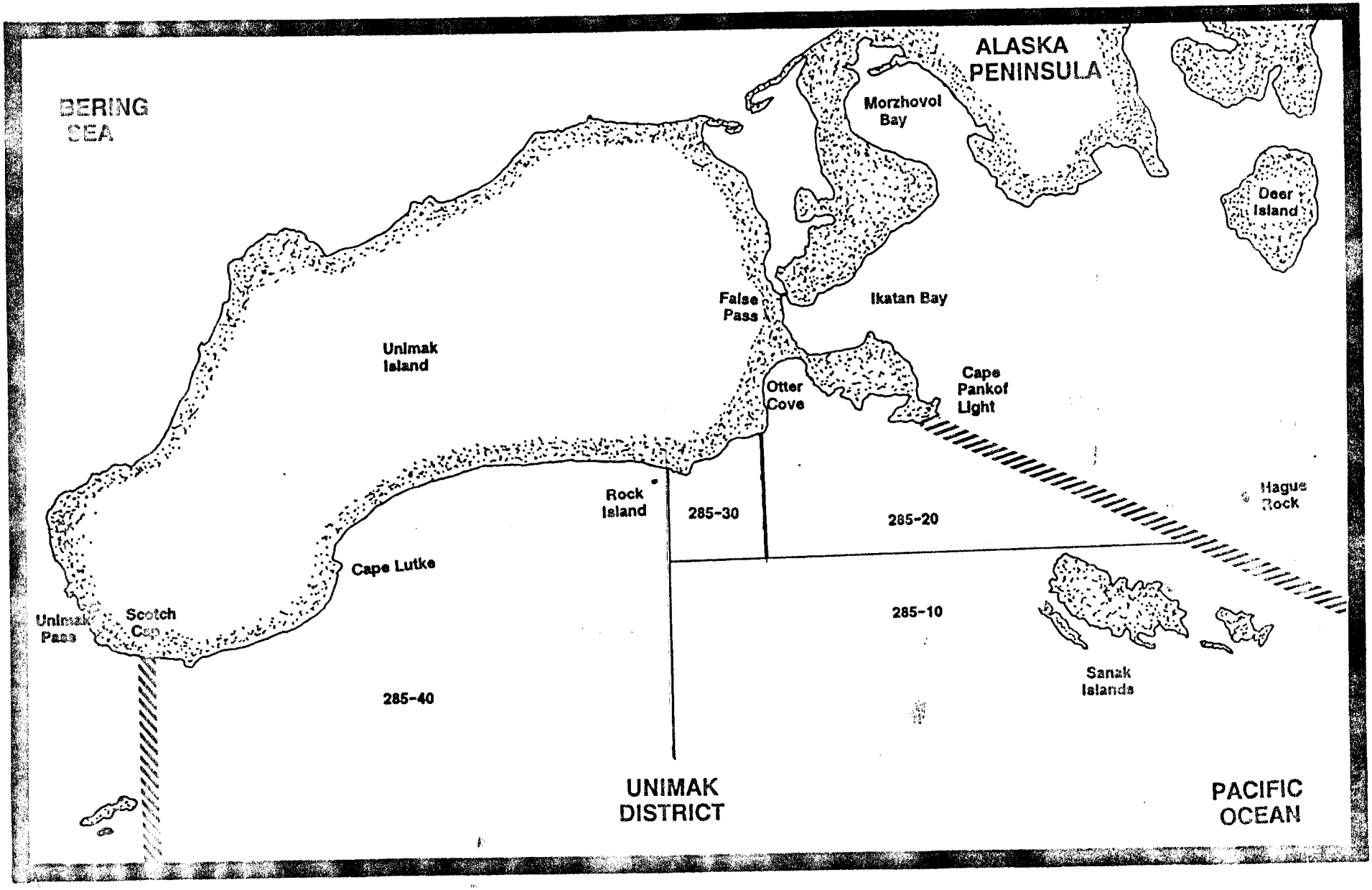


Figure 7. The Unimak District with statistical areas shown.

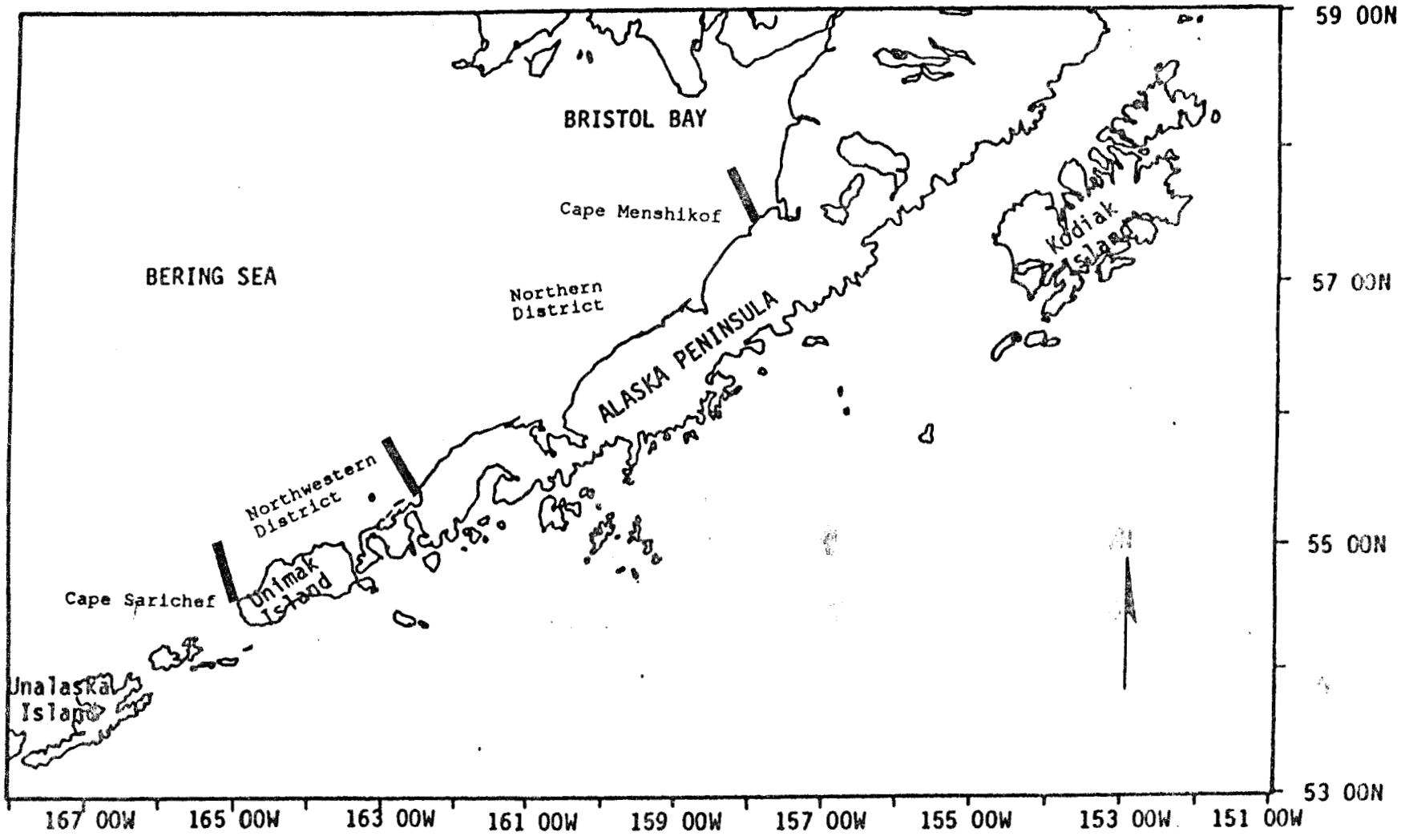


Figure 8. The North Peninsula Area with the Northwestern and Northern Districts shown.

OBJECTIVES

The objective of the sampling program is to determine sockeye and chum salmon age composition from the catch in the Alaska Peninsula fisheries with a level of precision necessary for the development of brood tables for those major systems.

Long Term: Improve management of the salmon resources for the Alaska Peninsula and Aleutian Islands Management Areas through improved forecasting of runs, development of stock-recruitment relationships to assess escapement requirements, and accurate assessment of stock contribution levels for mixed stock fisheries.

Short Term: Develop catch brood tables for the major sockeye and chum stocks, and determine age composition for each species of all major stocks.

1. Determine salmon catch and effort by species and statistical area (Table 1).
2. Determine the sockeye and chum sex and length composition for the major terminal fisheries within standard levels of precision.
3. Determine the chinook, sockeye, chum, and coho weight-length relationships for the terminal fisheries.
4. Determine the age composition of chinook, sockeye, chum, and coho salmon for all major stocks.
5. Establish an archive of scales suitable for analysis of stock separation in interception and mixed stock fisheries.

SUPERVISION

The Area Research Biologist (ARB), Bob Murphy, will supervise the catch sampling crews at Port Moller and King Cove and escapement sampling at Bear Lake and Ilnik River. The ARB will be in Port Moller from approximately 7 May to 15 September, and in King Cove for a short period in July to participate in and evaluate sampling operations. The ARB will monitor escapement sampling at Nelson Lagoon and Orzenoi River, and assist with aging scales collected

Table 1. Districts, sections, and statistical areas for the Alaska Peninsula and Aleutian Islands Management Areas, 199X.

Fishing Area Location	Statistical Areas
SOUTH PENINSULA	
Southeastern District	
Southeast District Mainland	281-10; 281-20; 281-31; 281-32; 281-33; 281-35; 283-75; 283-80; 283-90
Shumagin Island Section	282-11; 282-12; 282-13; 282-21; 282-22; 282-23; 282-24; 282-25; 282-26
South Central District	
Canoe Bay	283-63; 283-64
Pavlof Bay	283-61; 283-62; 283-65
Southwestern District	
Volcano Bay	283-51; 283-52
Belkofski Bay	283-40
King Cove	283-33
Cold Bay	283-32; 283-34; 283-35
Deer Island	283-31
Thin Point	283-20
Morzhovoi Bay	283-12
Ikatan Peninsula to Cape Lazaref	311-60 (June catch) 284-40; 284-50; 284-60
Unimak District	
Cape Lutke	284-20
ALEUTIAN ISLANDS AREA	
Unalaska District	302-22
NORTH PENINSULA	
Northwestern District	
Urilia Bay	311-32
Swanson Lagoon	311-52
Bechevin Bay	311-60 (Post-June catch)
Izembek-Moffet Bay Section	312-10; 312-20; 312-40
Northern District	
Black Hills Section	313-10
Nelson Lagoon Section	313-30
Herendeen Bay	314-20
Harbor Point to Cape Seniavin	314-12; 315-11; 315-20
Cape Seniavin to Strogonof Point	316-10; 316-20; 316-22; 316-25
Outer Port Heiden Section	317-10
Inner Port Heiden Section	317-20
Cinder River Section	318-20

from these areas. The ARB will be in regular contact with Arnie Shaul the Area Management Biologist in Cold Bay, Jim McCullough the Area Management Biologist in Sand Point, and Bruce Barrett the Regional Finfish Research Biologist in Kodiak, catch sampling crews in Port Moller, King Cove, Sand Point, and escapement sampling crews at Bear, Ilnik, Orzenoi, and Nelson Rivers.

PERSONNEL

Two and three person crews will be stationed to sample the commercial salmon catch for the Alaska Peninsula Management Area at Port Moller and King Cove. Sand Point will have a one person crew from 1- 20 July.

Dates of Sampling Events

The Port Moller sampling crew is expected to begin collection of age composition data on 2 June or 3 June, or when fish become available during the standard Monday through Thursday commercial fishing period, and complete sampling on approximately 31 August. The Port Moller crew will be responsible for catch sampling the commercial fisheries on the North Peninsula and possibly the South Peninsula commercial catch, if delivered to Port Moller and unavailable to the sampling crew in King Cove.

The King Cove sampling crew is expected to begin collection of Age-Weight-Length (AWL) data on 21 July and complete sampling about 18 August. The King Cove crew will be responsible for catch sampling the commercial fisheries on the South Peninsula, primarily the South Unimak, Shumagin Islands, Southeast Mainland area, and Urilia Bay.

Sampling in Sand Point will be conducted from 1 July through 20 July. The primary duty in Sand Point is to sample the Southeast Mainland and Shumagin Islands Sections, and additional areas when possible. All openings in the South Peninsula are by emergency order, and therefore, no strict sampling schedule can be followed.

BUDGET

The FY92 remaining budget will be sufficient to operate the project through 30 June 1992. The FY93 budget, if approved, will be sufficient to implement the Port Moller sampling crew from 1 July through 31 August, 1992 and from 1 June through 30 June 1993, while the King Cove sampling crew from 21 July through 20 August 1992 and Sand Point from 1 July through 20 July.

METHODS

Samples from the designated areas are to be representative. To ensure that this occurs, mixed loads from multiple areas will not be sampled nor will there be any pre-selection of fish for length, sex, or condition. The tender schedules and locations will allow the sampling of pure loads obtained from the separate areas. To ensure that samples are not missed the crews will begin sampling the first day the respective species catches are delivered from the designated sampling areas for each week (Sunday to Saturday). If the sampling crew believes that there is a high probability of collecting samples from the same area on more than one occasion during a week, the crew should try to collect the sample over the entire week. If it is doubtful as to whether or not another sample can be collected later in the week, the crew should collect all the samples when they are first available. Additional sampling may occur at Canoe and Urilia Bay. It is important to determine where the tenders have loaded fish. With the set gill net fishery on the South Peninsula, the tenders run a circuit to the sites. On the South Peninsula, the tenders land in both Sand Point and King Cove, with the majority landing in King Cove. The accurate identification of area of catch for each tender will allow terminal purse seine chum (and one sockeye) catch area to possibly be used as escapement sampling.

Specific procedures for collecting and recording salmon age (scales) are in Appendix A and B. The accuracy of the data is the responsibility of the crew leaders. All questions concerning collection procedures should be brought to the attention of the ARB at the first available opportunity. The ARB is available via radio or telephone.

Sample sizes are statistically derived to include necessary criteria to address problems that may affect the accuracy and precision of age composition work or stock composition methodologies. Catch sampling crews will be collecting 600 samples/period/area for chinook, sockeye, and coho salmon, and 440 samples/period/area for chum salmon.

A sample size of 600 or 440 fish/species/period/area is the maximum. The maximum may not always available, especially for small local runs and early and late in the season. Do not sample an area unless at least 75 fish can be sampled for a given species during a period. The exceptions this rule would be for a run such as Thin Point Lake sockeye, or other areas where the Alaska Department of Fish and Game (ADF&G) has limited knowledge about the run. When deliveries are mixed between two or more fishing areas, it is best to wait for another tender with a pure load of salmon before sampling. Some areas may never have a pure load (i.e. Swanson Lagoon). For these areas, try to sample the fish when deliveries are 90% or more from one area (mark the percent of each fishing area on the top of each AWL form). Areas that will never be greater than 90% pure (i.e. Catherine's Cove), sample as time permits. Future analysis of the data will take the mixture into consideration.

All original samples taken in Port Moller will remain with the ARB. Scale samples from catch and escapement sampling will be aged by the ARB or an assistant inseason. Periodically, samples collected in King Cove, or elsewhere, will be sent to Port Moller. To ensure safe delivery of data, notify the crew leader before and following the sending of data. To ensure safe delivery notify the crew leader: 1) that the data is being mailed (use a secure moisture proof container); 2) what data is being sent; 3) when delivery is expected in Port Moller; and 4) who is transporting the data. The crew leader at King Cove will maintain a log book of all outgoing catch samples. It is imperative that every precaution be taken to ensure the safe delivery of the samples to Port Moller.

Sockeye and chum sampling are the top priorities during all periods from the specified fishing areas. Chinook and coho salmon will also be sampled as time allows. During the fall, coho salmon will be samples as when possible.

The King Cove crew will be responsible for pressing all scales that are collected in King Cove and Sand Point, and the Port Moller crew will be responsible for pressing all scales collected in any other location, unless otherwise instructed differently. The ARB and a trained assistant will read all scales collected in-season.

All crews will sample the first day of each period as the salmon become available. For each AWL sample, scales from the preferred area will be taken and as defined in Appendix A and B.

Weight sampling of salmon will occur in major fisheries when requested by the Area Management Biologists. Samples will be randomly selected so that they are representative of the harvest.

Length sampling of salmon will be limited to terminal fisheries where escapement sampling at a weir is not conducted (Table 2 and Table 3). In terminal catches, where no weirs are present, the standard 600 lengths (for sockeye and 440 for chum salmon) per week will be maintained, when a two or more person crew is used, to provide an adequate sample of the younger age fish for forecasting.

All crews should report all fin clipped and tagged fish to the ARB. For chinook salmon having a clipped adipose fin, the head should be sealed in plastic, frozen, and sent to Andy McGregor, ADF&G, Juneau, Alaska, 99824. Catch location, catch date, gear type, species, tag number, type of tag, length, weight, and several scales from the preferred area should be included with the catch report.

Crews are to anticipate supply shortages in-season and to notify the ARB before the supplies are exhausted. Each crew leader will keep a daily log book of activities. A report from each crew leader outlining problems encountered and solutions, as well as any suggestions for the project should be turned into the ARB at the end of the season along with an equipment list and place of storage.

Appendix C contains general equipment, cabin maintenance, and crew policy.

Table 2. Sockeye salmon catch sampling schedule for the Alaska Peninsula and Aleutian Islands Management Areas, 1992.[a]

Crew	SAMPLING AREA			Season	SAMPLE			
	District/Section	Geographic Area	Statistical Area(s)		Freq.	Size	Data	Fishery
Port Moller	Northern District:							
	Nelson Lagoon Section	Nelson Lagoon	313-30	5/1-9/30	Weekly	600	AL[b]	Terminal
	Bear River Section	Harbor Point to Cape Seniavin	314-12,315-11,20	5/1-9/30	Weekly	600	Scales	Mixed
		Cape Seniavin to Strogonof Point	316-10,20,22,25	6/25-9/30	Weekly	600	Scales	Mixed
	Ilnik Section	Ilnik Lagoon	316-22	5/1-9/30	Weekly	600	AL	Terminal
	Outer Port Heiden Section	Outer Port Heiden	317-10	8/1-9/30	Weekly	600	Scales	Mixed
	Inner Port Heiden Section	Inner Port Heiden	317-20	5/1-9/30	Weekly	600	AL	Terminal
King Cove	Northwestern District:							
		Urilia Bay	311-32	6/1-8/10	Weekly	600	AL	Terminal
	Southeastern District:							
	Southeast District Mainland	Beaver and Balboa Bays, Stepovak	281-70,80,90	6/1-9/30	Weekly	600	Scales	Mixed
	Shumagin Is. Section	Shumagin Islands	282-10,11,20,25,30,35,40,42	7/1-8/30	Weekly	600	Scales	Mixed
	South Central District:							
		Long Beach	283-15	6/1-9/30	Weekly	600	Scales	Mixed
		Cape Tolstoi	283-21	6/1-9/30	Weekly	600	Scales	Mixed
		Canoe Bay	283-24	6/1-9/30	Weekly	600	Scales	Mixed
		Pavlof Bay	283-23,25	6/1-9/30	Weekly	600	Scales	Mixed
	Southwestern District:							
	Thin Point Section	Thin Point Lagoon	284-75	6/1-9/30	Weekly	600	AL	Terminal
		Morzhovoi Bay	284-20	6/1-9/30	Weekly	600	AL	Terminal

-Continued-

Table 2. (page 2 of 2)

Crew	SAMPLING AREA			Season	SAMPLE			
	District/Section	Geographic Area	Statistical Area(s)		Freq.	Size	Data	Fishery
King Cove	Unimak District:	Cape Lutke	285-40	6/1-9/30	Weekly	600	AL	Mixed
		Ikatan Peninsula to C. Lazaref	284-90,285-20,30	6/1-9/30	Weekly	600	Scales	Mixed
	Unalaska District	Aleutian Islands Management Area	302-	6/1-9/30	Weekly	600	Scales	Mixed

[a] Follow the same sampling schedule for chinook and coho from the designated areas. However, collect only scales from coho. Take both scales and lengths from chinook. Often it will not be possible to collect weekly samples from all the areas, but if samples are available they need to be collected.

[b] Collect scale samples (age data), lengths, and sex data.

Table 3. Chum salmon catch sampling schedule for the Alaska Peninsula and Aleutian Islands Management Areas, 1992.[a]

Crew	SAMPLING AREA			Season	SAMPLE			
	District/Section	Geographic Area	Statistical Area(s)		Freq.	Size	Data	Fishery
Port Moller	Northern District:							
	Nelson Lagoon Section	Nelson Lagoon	313-30	5/1-9/30	Weekly	480	AL[b]	Terminal
	Moller/Herendeen Bay Section	Herendeen Bay	314-20	5/1-9/30	Weekly	440	AL	Terminal
	Bear River Section	Harbor Point to Cape Seniavin	314-12,315-11,20	5/1-9/30	Weekly	440	Scales	Mixed
		Cape Seniavin to Strogonof Point	316-10,20,22,25	6/25-9/30	Weekly	440	Scales	Mixed
King Cove	Northwestern District:							
	Izembek-Moffet Bay Section	Izembek-Moffet Bay	312-10,20,40	6/1-8/10	Weekly	440	AL	Terminal
		Swanson Lagoon	311-52	6/1-8/10	Weekly	440	Scales	Mixed
	Southeastern District:							
	Southeast District Mainland	Beaver and Balboa Bays, Stepovak	281-70,80,90	6/1-9/30	Weekly	440	Scales	Mixed
	Shumagin Is. Section	Shumagin Islands	282-10,11,20,25, 30,35,40,42	6/1-9/30	Weekly	440	Scales	Mixed
	South Central District:							
		Coal Bay	283-17	6/1-9/30	Weekly	440	Scales	Mixed
		Canoe Bay	283-24	6/1-9/30	Weekly	440	Scales	Mixed
		Pavlof Bay	283-23,25	6/1-9/30	Weekly	440	Scales	Mixed
	Southwestern District:							
		Volcano Bay	284-36	6/1-9/30	Weekly	440	Scales	Mixed
		Belkofski Bay	284-42	6/1-9/30	Weekly	440	AL	Terminal
		Cold Bay	284-62,65,67	6/1-9/30	Weekly	440	Scales	Mixed
		Morzhovoi Bay	284-20	6/1-9/30	Weekly	440	AL	Both

-Continued-

Table 3. (page 2 of 2)

Crew	SAMPLING AREA			Season	SAMPLE			
	District/Section	Geographic Area	Statistical Area(s)		Freq.	Size	Data	Fishery
King Cove	Unimak District:							
		Cape Lutke	285-40	6/1-9/30	Weekly	440	AL	Mixed
		Ikatan Peninsula to C. Lazaref	284-90,285-20,30	6/1-9/30	Weekly	440	Scales	Mixed

[a] Follow the same sampling schedule for chinook and coho from the designated areas. However, collect only scales from coho. Take both scales and lengths from chinook. Often it will not be possible to collect weekly samples from all the areas, but if samples are available they need to be collected.

[b] Collect scale samples (age data), lengths, and sex data.

Appendix D contains information on first aid and safety.

The responsibility of proper identification of catch area will be a necessary component of the dockside catch sampling crew.

DATA ANALYSIS AND REPORTING

The age composition and associated standard errors will be computed for all samples. A Regional Information Report and Technical Fisheries Report will be completed for the 1992 season.

Prior to 1 May 1993 the ARB will author a Technical Fisheries Report and a Regional Information Report, which covers the results of the 1992 catch sampling season.

ADF&G is using scale pattern analysis to separate sockeye stocks in mixed stock fisheries. North Peninsula sockeye fisheries from Harbor Point to Strogonof Point and escapement samples of sockeye scales and completed Opscan Forms will be sent to Kodiak where the scales will be digitized. The ARB will work with Charlie Swanton (ADF&G, Kodiak) to develop models which may allocate the catch to the system of origin for sockeye salmon. A Technical Fisheries Report for 1992 will be completed by May 1993.

LITERATURE CITED

Murphy, R.L. 1992. Number of salmon systems and distribution of escapements in the Alaska Peninsula and Aleutian Islands Management Areas, 1986-91. Regional Information Report No. 4K92-15, Alaska Department of Fish and Game, Division of Commercial Fisheries, Region IV Report, Kodiak.

APPENDIX A

Alaska Peninsula Scale Sampling Technique

ALASKA PENINSULA SCALE SAMPLING TECHNIQUE

If you have not taken scales before or if you have any questions ask somebody who has prior experience in the sampling procedure. Scales must be readable to be useful, so follow proper techniques when sampling.

Gum Cards

A scale card is a gum-backed sheet numbered 1 through 40. Samples are placed on the cards with no attempt to separate the fish by their sex.

It is important to keep the gum card dry at all times. If weather does not allow you to do this it is best to suspend sampling until dryer conditions prevail. A wet gum card is useless as the scales will fall-off before a readable impression can be made.

A new scale card is started for each day. Even if a card is not filled a new card is still to be started for each day. Also, a different card is to be used for each location, i.e. Nelson Lagoon vs. Herendeen Bay. It is important that scale cards and numbers match the corresponding AWL sheet.

Scales

1. Clean the scale by wetting it and rubbing it between your fingers. Make sure no dirt, slime and skin (no silver color) remain on the scale.

2. Mount the scale on the gum card with the ridged side up. The ridged side is the same side that is exposed on the salmon.

3. One scale will be taken from sockeye and chum. Three scales will be taken from chinook salmon, and four scales from coho salmon.

4. Take the preferred scale if it is available, if not available take a scale but note on the AWL form that it is not preferred.

5. Scales should be neat, clean, and orderly.

Age-Weight-Length (AWL) Sampling Form

Age - Scale samples are taken for age.
Weight - Taken to nearest tenth of a kilogram on any adult fish not being returned live to the water (if required).
Length - Taken with the fish laying flat from the mid-eye point to the fork of the tail (if required). Measure to the nearest millimeter.

** Fill in all information on the AWL form.
** Each AWL form should match up with the appropriate scale card.

APPENDIX B

Completion of Mark-Sense AWL Forms

Length, Sex, and Scale Sampling Procedure for Sampling:
Using Mark-Sense Forms

INTRODUCTION

Salmon from terminal catches are sampled for length, sex, and scales annually. This data base is essentially used to provide sound management of the salmon resources. This information is used by management and research biologists for: (1) forecasting run strengths; (2) setting escapement goals; (3) examining the productivity of each system; (4) salmon growth analysis; (5) catch apportionment (based on age composition and/or scale pattern analysis); (6) in-season run estimation; and (7) to gain a better understanding of the biology of each stock.

For clarification purposes, a SCALE SAMPLE and SUB-SAMPLE will be defined as follows:

SCALE SAMPLE: A data set collected from a specific sampling location, containing scales and data from a single species, collected during a single year. All data forms and scale cards of a single SAMPLE have the same statistical code. AWL and scale card number in a sample are consecutively and chronologically ordered.

SUB-SAMPLE: Any portion of a scale sample consisting of consecutively numbered AWL's and scale cards. SUB-SAMPLES usually consist of one or more time segments of a sample.

To be useful, data must be recorded on the mark-sense forms neatly and accurately. The following procedures are to be followed when sampling for length, sex, and scales using mark-sense AWL forms.

COMPLETING THE FORMS:

A completed mark-sense AWL form and accompanying gum card for sampling commercial catches of sockeye and chum salmon are shown in Appendix B. A completed AWL form and accompanying gum cards for sampling commercial catches of chinook and coho salmon is shown in Appendix B.

Complete each section of the left side of the mark-sense form using a soft No. 2 pencil and darken the corresponding blocks as shown in the figures. Make every effort to darken the entire block as partially filled blocks are often missed by the optical scanner which reads and records the data from the mark-sense AWL forms. If the blocks are not darkened properly, considerable time will required to edit these forms during the winter. Label only one form at a time to avoid "the carbon paper effect" and resulting stray marks.

Description:
For catch sampling: Area/Samplers (name and Wrestler, Recorder, Plucker (WRP))

Gum Card:

The AWL forms and corresponding gum card(s) are numbered sequentially by date throughout the season starting with 001 for each fishery. A separate numbering sequence will be used for each species, gear type, district, and geographic location. Consult your crew leader for the current card number. Sockeye and chum samples will have only 1 card per AWL form as shown in Appendix B. Coho and chinook samples will contain up to four cards per AWL form as shown in Appendix B.

Species:

Refer to the reverse side of the AWL form for the correct digit.

Day, Month, Year:

Use appropriate digits for the date the fish are caught, not the date that they are processed.

District:

List only one district. Consult project leader for appropriate district and subdistrict numbers.

Subdistrict:

List a single subdistrict if it is known and all the fish sampled were from that single subdistrict. Leave it blank if more than one subdistrict is involved or if the subdistrict is unknown.

Stream:

Leave blank for catch sampling.

Location:

For catch sampling list the appropriate port code (Appendix B.1).

Project:

Refer to the reverse side of the AWL form for the correct code.

Gear:

Refer to the reverse side of the AWL form.

Mesh:

Leave blank unless specifically instructed by supervisor to do otherwise.

Type of length measurement:

Use (2) mid-eye to fork-of-tail (unless specifically instructed to do otherwise). Refer to Appendix B.

# of cards:

Mark 1 when sampling sockeye and chum salmon (Appendix B). Mark 1A, 1B, 1C, or 1D when sampling chinook and coho salmon and write the card numbers perpendicular to the left of the fish # column as shown in Appendix B.

Appendix B.1. Assigned port and weir location codes.

Port Codes
150 - King Cove
151 - Port Moller
152 - Dutch Harbor
153 - Akutan
154 - Sand Point
155 - Bear River, ADF&G Camp
156 - Nelson River, ADF&G Camp
157 - Canoe Bay
158 - Ilnik Lagoon, ADF&G Camp
159 - Sandy Lake
160 - Thin Point Lake
161 - Urilia Bay
162 - Middle Lagoon
163 - Orzenoi River, ADF&G Camp

It is extremely important to keep the mark-sense forms flat, dry, and clean. Fish slime and water curling will cause data to be misinterpreted by the optical scanning reader machine. If unnecessary pencil marks, dark spots, etc. are visible, they need to be erased or else the machine will misinterpret the mark. It is necessary to completely fill in all information and darken the boxes (if needed) after each day.

Additional data columns are available on the reverse of the AWL for individual project use. If you take weights, you need to transfer the dark boxes on the front left margin of the form to the left margin on the back. This code needs to be exactly as it appears on the front.

GUM CARD(S):

Fill out the gum cards as shown in Appendices B.2, B.3, and B.4.

Species:
Write out completely (i.e., chinook, sockeye, etc.).

Locality:
For catch sampling, write down area in which fish were caught followed by the word catch (e.e., Herendeen Bay Catch).

Statistical code and Sampling date:
Transfer the appropriate digits from the AWL form.

Gear:
Write out completely.

Collector(s):
Record the last name or initials of the person(s) sampling.

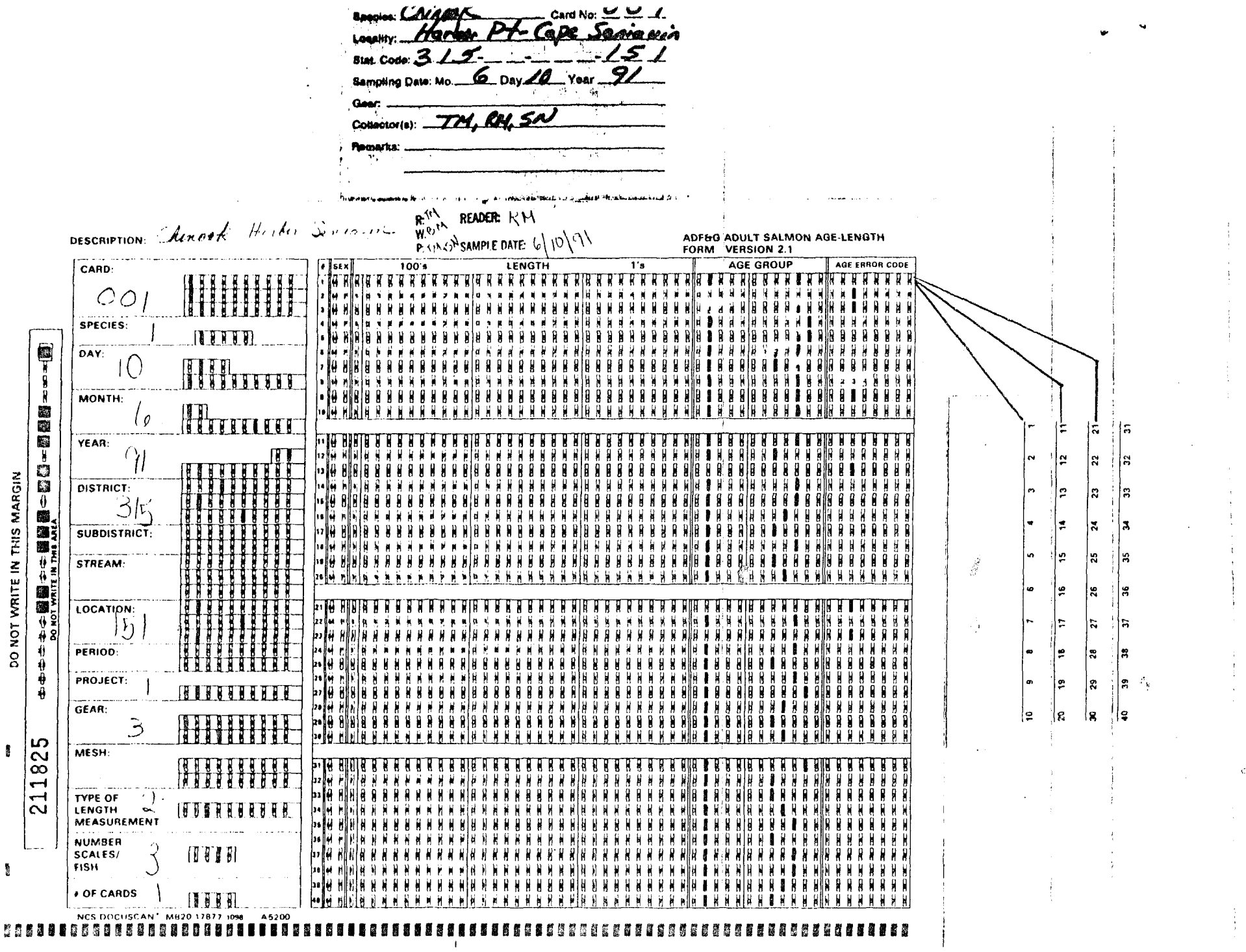
Remarks:
Record any pertinent information such as; number of scales per fish sampled, vessel/tender name, etc. Transfer this same information to the top margin of the AWL.

SAMPLING:

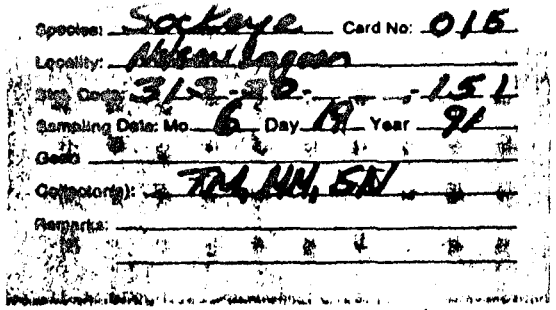
A. GENERAL

1. Sex the fish and darken M or F in the sex columns. If any difficulty was encountered in this procedure, write "I had trouble sexing these fish" on the top margin of the AWL and ask your supervisor for help as soon as possible before sexing additional fish.

2. Measure all species length in millimeters from the middle of the eye to the fork of the tail, refer to Appendix B. Record length by blackening the appropriate column blocks on the AWL form. Column 3 on the AWL form is used for fish over 999 millimeters



Appendix B.2. Chinook salmon AWL form and gumcard with three scales per fish.



REMK READER: RM
W: TM
P: SN SAMPLE DATE: 6/20/91

DESCRIPTION: Sockeye Nelson lgn

ADF&G ADULT SALMON AGE-LENGTH FORM VERSION 2.1

CARD: 015
SPECIES: 5
DAY: 19
MONTH: 6
YEAR: 91
DISTRICT: 342
SUBDISTRICT: 30
STREAM:
LOCATION: 151
PERIOD:
PROJECT: 1
GEAR:
MESH:
TYPE OF LENGTH MEASUREMENT: 2
NUMBER SCALES/ FISH: 1
OF CARDS: 1

#	SEX	LENGTH 100's	LENGTH 1's	AGE GROUP	AGE ERROR CODE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

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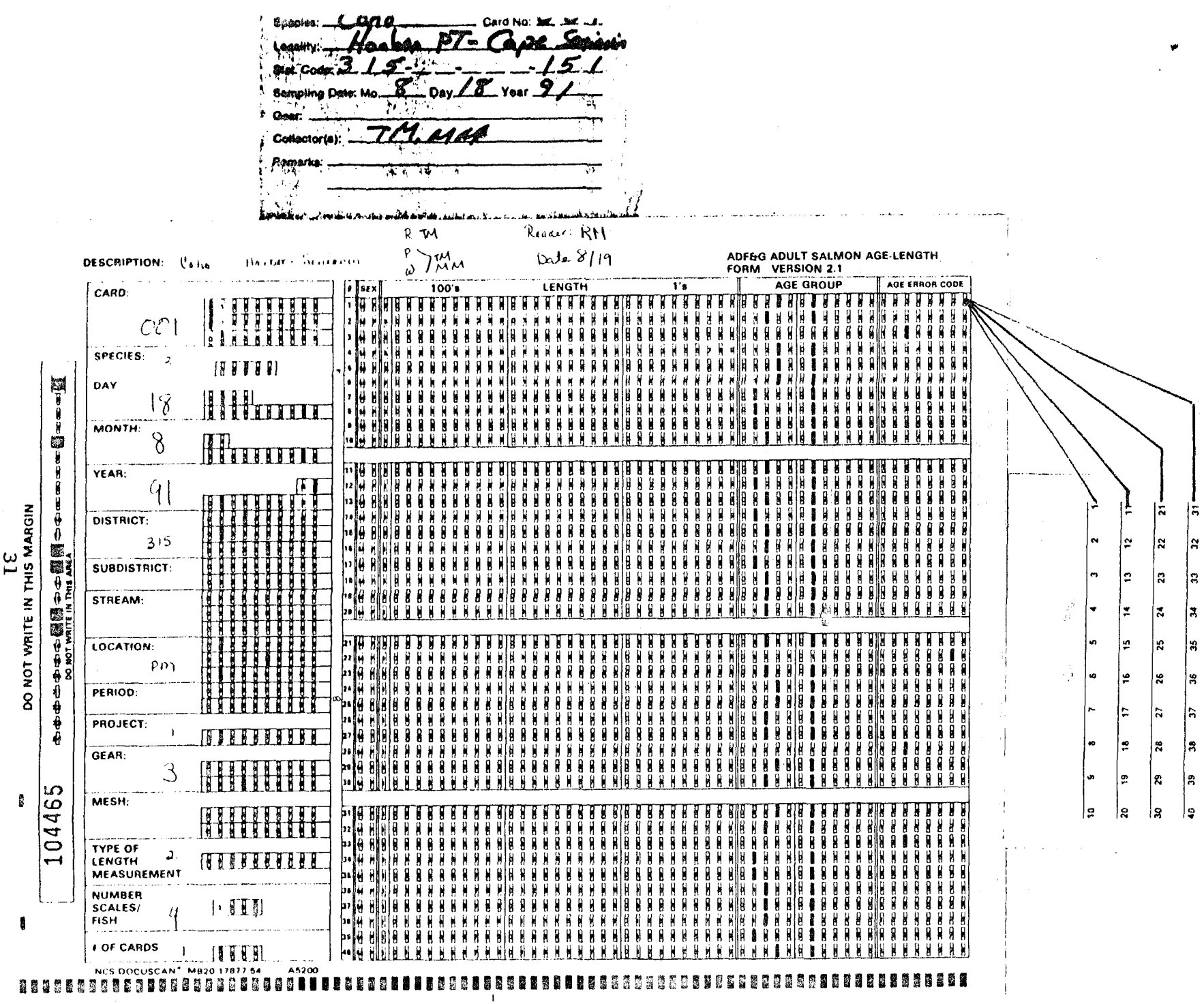
Appendix B.3. Sockeye salmon AWL form and gumcard with one scale per fish.



Appendix B.4. Coho salmon AWL form and gumcard with four scales per fish.

long. Measure all species of salmon to the nearest mm. Check the calipers daily before use to ensure the accuracy of the measurements.

3. Pluck the "preferred scale" from the fish using forceps. Remove all slime, grit, and skin from the scale by moistening and rubbing between fingers. The "preferred scale" is located on the left side of the fish, two rows above the lateral line on the diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. Refer to Appendix B. If the "preferred scale" is missing, select a scale within the preferred area on either the left or right side of the fish. If no scales are present in the "preferred area" on both sides of the fish, sample a scale as close to the preferred area as possible and darken the 8 under "age error code" on the AWL form.

4. Clean, moisten and mount scale on gum card directly over number 1 as shown in Appendix B. The side of the scale facing up on the gum card is the same as the side facing up when it was adhered to the fish. The exposed facing side is referred to as the "sculptured" side of the scale. The ridges on this sculpture side can be felt with a fingernail or forceps. Mount scale with anterior end oriented toward top of gum card.

5. When sampling sockeye and chum salmon repeat steps 1 through 4 for up to 40 fish on each AWL form.

6. When taking three scales per fish as with chinook or four scales per fish as with coho salmon sample the "preferred scale" and scale #2 and scale #3 as shown in Appendix B. Scale #2 is one inch to the left of the "preferred scale," scale #3 is located one inch to the right, and scale #4 is located between next to any of the other three preferred scales. All are two rows above the lateral line. Mount the three scales from fish #1 over 1, 11, and 21, or 31 if four scales are taken (coho), on the gum card as shown in Appendix B. Continuing, mount the 3 scales from fish #2 over 2, 12, and 22, etc.

7. Use plastic scale card holders to hold individual scale cards during sampling and cover the completed gum card with wax paper for storage.

8. When sampling at a weir, you may use the old AWL forms or field notebook to record the data. Keep the mark-sense forms in camp where they will be clean, dry, and flat. After sampling is done for the day transfer the data to the mark-sense forms on a daily basis. It is the responsibility of the data collector to transcribe the data before turning it over to the ARB.

9. Miscellaneous:

   a. When scales are sampled in wet conditions it is difficult to mount scales in a fashion so as to result in a good scale impression being made. Glue often obscures scale features and scales frequently adhere poorly to the card. Try to keep all the paperwork dry during this time. If the gumcard does get wet, the scales should be remounted.

b. For adipose clipped fish record the head tag number on the corresponding row in the first five columns on the reverse side of the AWL.

c. Look down the form from two angles after the data has been recorded to pick up any glaring mistakes. A common error occurs, for instance, in placing both the 4 and 7 of a 475 mm fish in the 100's column with nothing in the 10's column.

d. Keep all fish slime off forms and erase any stray marks on the forms before turning them in to your supervisor.

e. Write in all comments explicitly and completely under remarks, transfer remarks to top margin of AWL.

f. Responsibility for accuracy lies first with the primary data collector(s). The port supervisor will return sloppy or incomplete data to individual collectors. After editing a form, place your initials next to card #, but not in left margin. Editing these forms will save valuable time for the ARB during the winter, and is an extremely important part of your job duties.

10. As soon as possible after completion send the samples and mark-sense forms to the ARB in Port Moller. During scheduled radio calls before and following the sending of data to the ARB, the crew leader will notify the ARB: (1) that the data is being mailed (use a moisture-proof container); (2) what data is being sent; (3) when delivery is expected in Port Moller; and (4) who is transporting the data. It is important that these steps are followed to ensure delivery.

B. SAMPLING SCENARIOS:

1. Differing size crews if lengths are needed. If they are not, the Recorder should pluck scales instead.

a. One person: Wrestle the fish into the measuring board, wearing a glove on one hand. Measure the fish and write the sex and length down on the measuring board to be transferred to the AWL after ten fish have been measured. Next, pluck the preferred scale(s), clean, and mount on the gum card which is taped to the AWL in the clipboard which is sitting on the end of the measuring board. After 10 fish have been processed, remove the glove and record the sexes and lengths on the AWL with your clean hand. A slime rag may be helpful.

b. Two persons:

(1) When sampling more than one scale per fish, one person can wrestle the fish and record data while the other plucks and mounts the scales. The wrestler needs to wear a glove that he can slip off his writing hand to record the sex and length data on the AWL form, if necessary.

(2) When sampling one scale per fish, the person plucking the scales also records the data.

c. Three persons: One person wrestles the fish, one plucks and mounts the scales, and the third records the data or also plucks scales.

2. Sampling tote to tote:

a. When sampling for 3 or 4 scales per fish (chinook and coho) use a two or three man crew. If lengths or weights are needed, three persons will be required.

b. When sampling for 1 scale per fish (sockeye and chum) use a two or three man crew. If lengths or weights are needed, three persons will be required.

3. Sampling on a table connected to a vat:

a. Use three people for one scale per fish; one recorder or wrestler, one wrestler, and one plucker. Two people may be plucking if no length data is collected. The wrestler lays out and measures 10 fish at a time. The plucker samples these 10 fish, placing the scales on his fingers in a systematic manner before cleaning and mounting them on the gum card.

SCALE SAMPLING CHECKLIST

Clipboard	Pencils (No.2)	Gloves
Gum Cards	Forceps	Measuring board or calipers
AWL's	Wax paper inserts	Sampling Manual
Plastic scale card holders		

Some Reminders

1. For greater efficiency in scale reading and digitizing, mount scales with anterior end toward top of scale card.

2. AWL's should be carefully edited before submitting to ARB. This is extremely important, and cannot be emphasized enough. Re-check header information on AWL's; make sure all available information is filled in. Take extra care to use the catch date and not sample date. Page numbers should not be repeated; a frequent error is to begin a week's sample with the last page number used the week before. This is particularly important if the data regularly is sent to town; it is easy to forget which numbers were used. Crew leaders should take time to ensure that the boxes are being blackened correctly, if the boxes are not darkened properly or sloppily marked the optical scanner records the information incorrectly or misses it entirely. Keep marks within each

rectangle and completely fill them. Do not go outside the rectangle. After the AWL's are edited, place editor's initial next to page number, but not in left margin.

3. Check to make sure error codes (listed on back) are being used correctly, i.e. error code 7 is wrong species, error code 8 is non-preferred. Error code 6 is for the use of the scale reader, it refers to the reabsorption of the scale.

4. Transfer important comments from scale cards to AWL's. After pressing scales, the cards are seldom referred to again, and important remarks can be lost. Write comments in the top margin (not on the left side) or on the reverse of the AWL. If no room is available on the AWL to completely explain the remarks, use a separate piece of paper.

5. Never put data from different dates on one AWL or one scale card. Even if only one scale is collected that day, begin a new card and AWL for the next day.

6. If weights are requested to be taken, they may be noted in the right margin of the AWL during sampling, but be sure to transfer the weights to the appropriate columns on the reverse of the AWL before submitting it to the ARB, and darken in the code from the left front margin to the left back margin.

7. The data processing program uses the "litho code" on the AWL. (It is located in the lower left margin of the AWL.) It helps if the AWL's are used in the order of this code. It should not be hard to keep them in order if they are arranged that way before page numbering. Those who sample different areas throughout the season can arrange the litho codes in order before each sample is taken.

8. If AWL's get wrinkled or blotched they should be copied over before submitting to the ARB. The optical scanning machine is extremely sensitive to wrinkles and blotches and will misread or reject the sheets.

APPENDIX C

General Equipment, Camp Maintenance and Camp Policy

Equipment Maintenance

Equipment maintenance is perhaps one of the most important operations you will perform during the field season. The outboard motors and generators must be kept in good operating condition.

It will be the crew leader's responsibility to assign the most knowledgeable member of the crew to the job of maintaining and servicing the equipment. It will be this persons responsibility to see that all equipment is kept in operating condition.

Outboard Motors

Your outboard motor will perform longer and give less trouble if these suggestions are followed:

1. The correct outboard fuel mixture is 50:1. Always pour the oil into the tank first, then add 2 or 3 gallons of gas and mix thoroughly, then fill tank to capacity always using a large funnel and chamois filter.

2. Chain saws have a fuel mixture 25:1. Chain saw gas should be mixed in a 5 gallon can and clearly marked that it is chain saw fuel.

3. When mixing gasoline or filling the tanks of the generator, stove or lantern, keep the following in mind:

   a. Always mix fuel tanks or equipment under cover to prevent water contamination and always use a funnel and filter.

   b. Fill camp stoves and lanterns outside as the danger of fire is very real.

   c. A little extra effort toward cleanliness will pay in hours of trouble free operation.

4. Always place outboard motors in neutral when starting.

5. Check daily the clamp screws that hold the outboard to the transom. Also routinely check the motor for loose screws and bolts, cracks, and breaks, especially in the area of the lower unit.

6. Never start or run an outboard in the tilted position.

7. In the normal operation of a water pump, a "tell-tale" stream of water is discharged from a hole in the bottom edge of the cowling or from the back of the shaft. If this stream of water stops, the water pump is not working and the motor should be shut off. The side plate over the water intake can be removed for temporary relief as it may be plugged. If the pump continues not to function, the outboard should not be run, and a report to base camp should be made.

8. Check the grease in the lower unit of the outboards propeller once a week, and drain and replace the lower unit grease every three weeks. Jet units must be greased daily. This is crucial. Special grease guns will be provided.

9. If the skeg or jet unit hits bottom, check the screws for tightness and housing damage.

10. If your outboard will not start, check the following:

    a. Check to see if the fuel line is connected to the motor and the tank and not pinched or kinked.

    b. Check to see if there is water in the gasoline.

    c. Check to see if the engine is flooded.

    d. Check the spark plugs as they may be fouled or defective (replace if needed).

11. All outboards are to be tilted in the up position when moored stations to preclude silt accumulation in the jet unit or water pump and skag or housing damage.

It should be emphasized that the salmon enumeration counts and sampling must continue, as they are very important to the program.

Boats

1. Boats are to be kept clean and free of loose tools and debris, and moored at locations where they are not subject to damage by wave action or through contact with the river bottom in rock laden areas.

2. Each crew leader will be responsible for maintaining mooring stakes on the river bank sufficient for the boats assigned to his subproject plus one transient craft. Further responsibility includes maintaining a bow line on each assigned craft and ensuring that each boat is properly moored at the end of each work day to preclude possible loss or damage.

Generators

Portable generators may be supplied to field camps. Their maintenance follows the same line as for the outboards. Since some of the generators have 4-cycle engines, mixed gas must not be used. The crankcase oil reservoir should be checked daily and maintained at the full level. After 25 hours of operation the oil should be changed. Spark plugs should be checked after every five (5) hours of operation.

Camp Maintenance

Maintaining a clean and efficient camp site is required. A few of the things to check are:

1. Maintenance of living accommodations and other installations will be performed as necessary. All materials necessary will be provided.

2. Grounds will be kept free of liter. All garbage will be bagged up and disposed of at the nearest sanitary landfill at least once a week. Special precautions should be observed to ensure that garbage does not attract bears and other scavenger species.

3. Upon completion of the summer season, all camp equipment will be cleaned preparatory to winter storage.

4. All sampling nets, tents, and tarps must be dry before being stored.

5. A complete camp inventory will be taken by the crew leader at the close of the field season.

6. All skiffs and ATV's will be chained and locked to a stationary object.

Camp Policy

1. No alcoholic beverages are to be stored in areas open to public view including cook tents. If alcohol is consumed at a camp an employee must be off-duty and under no circumstances shall he or she engage in the operation of any State equipment, including boats and motors nor shall he or she return to duty status under the influence of alcohol.

2. The crew leader of each sampling station shall establish a policy on living standards and personnel behavior in accordance with normal guidelines.

3. All sampling stations will operate as directed. No crew leader shall be off location for more than 24 hours unless specifically authorized by the ARB. Time-off for individual crew members shall be scheduled by the crew leader and shall have the option as to whether sampling duties allow time-off from the location.

4. All employees will be required to act in a professional manner at all times and shall be especially courteous to the public.

5. It will be the responsibility of the crew leader to report any equipment abuse to the ARB and to ensure that abuse does not occur.

   Additionally, the crew leader must also report within 24 hours to the ARB any loss of equipment which occurs.

Food Orders

Grocery orders for Ilnik and Bear Rivers should be placed with Port Moller, Nelson River with Cold Bay, and Orzenoi River with Sand Point during the evening radio schedule.

Personal Gear and Pets

Generally 100 lbs. is a maximum for personal gear. If you anticipate bringing more than that amount to your field camp, check with your supervisor first. Pets, (especially dogs) should not be brought to our field camps. Past experience indicates, that one or more of the following problems usually occur:

1. Problem of transportation in small planes for some pets.

2. Who is going to pay for the pet food and who is going to purchase it in town?

3. Some pets attract bears, etc. Dogs will chase a bear until the bear gets mad and then when the bear goes for the dog, the dog will run to his owner or the cabin.

4. Your pet may not be compatible with the other members of your camp and may interfere with work.

5. A pet that gets sick or injured can cause you considerable expense if it must be brought back to town.

6. Rabies is common on the Alaska Peninsula, be careful of all mammals including ground squirrels, fox, wolf, otters, and your pet. If bitten save the head of the animal if possible, wrap the head in several layers of plastic, put in a good box and freeze if possible. Notify your supervisor of the accident and your supervisor will send you into Anchorage if tests for rabies prove positive. Burn and bury remaining parts of the carcass away from water sources and cabins, take precautions such as wearing plastic gloves to dispose of the carcass. Do not send suspected rabies animals out of your area unless you are bitten, burn and bury the carcass as instructed.

Radio Schedules

Radio schedules will be made twice during every day. Radio schedules are normally at 8:45 a.m. and 7:45 p.m. on 3.230 megahertz unless otherwise specified. The morning schedule is used for passing along the current weather (visibility, ceiling, precipitation, etc.) and the previous days escapement counts. The evening schedule are used for updated escapement counts, grocery and supply orders, and the latest pertinent fishery announcements. All camps must complete the schedule within 15 minutes, so we do not invade another areas time allotment. So, keep the conversation short. Personal conversation between camps should be arranged as not to interfere with any ADF&G schedules.

If a camp does not respond to two consecutive radio schedules, the worst will be assumed and a plane will be dispatched. If for some reason you know that you will not be able to make a schedule, notify beforehand either Cold Bay, Sand Point, or Port Moller.

Fish and Wildlife Violations

This is not intended as an inclusive procedure for handling violations, it is not your job. Use this as a guideline for obtaining the necessary information and/or evidence to show and prove that a violation has been committed. It is important to be familiar with the commercial fishing, subsistence fishing, sport fishing, and hunting regulations in your area. Violation procedures are printed on the back cover of the commercial fishing regulation book. Request the regulation book if your camp does not have one.

The use of the 5 W's can greatly aid the Fish & Wildlife Protection officer in obtaining sufficient evidence for a case.

1. What is the violation?
2. When did the violation occur (date, time, tide condition, etc.)
3. Where did the violation occur?
4. Who is in violation and who are witnesses?
5. Why was the violation committed?

It is important that all witnesses to a violation be interviewed and all statements pertaining to a violation be recorded along with their names and addresses. If you have a camera available, pictures are extremely valuable in prosecuting offenders. Collect as much information as possible and contact your supervisor or a State Trooper from the Fish and Wildlife Protection Division immediately. If you do not feel comfortable, or your personal safety may be in danger, do not pursue the violation. Contact your supervisor and they will handle the violation. Be aware that you do not have the power to arrest somebody and never attempt this.

Firearms

A State rifle will be provided at each camp. You may bring your own firearm if you wish. Loaded guns are prohibited inside the camp facilities. Loaded, meaning a round in the chamber of the gun. Anyone handling a firearm should always treat it as if it were loaded. Guns should be kept clean and oiled and be completely unloaded while being cleaned. Any horseplay with or misuse of firearms while working for the Department of Fish and Game will not be tolerated and will be grounds for immediate dismissal. Completely unload a firearm of all rounds before entering a vessel or airplane. Keep an empty chamber under the firing pin of each pistol.

Bears

Do not antagonize bears - each one is a potential danger. Do not encourage bears to come around camp by leaving food or unburned garbage around. Do not shoot at a bear unless, in your best judgement, he is endangering someone's life or damaging personal or state property. Use your best judgement on whether to shoot a bear if property is at stake. When, and if, trying to

frighten a bear away by shooting - do not fire toward it. By change, you may wound it by pulling the shot, ricochets, etc. If you are having problems with a particular bear around camp, call the office and notify them of the situation. The Game Division personnel will take care of the problem, if it is feasible.

Garbage

Burn all garbage to prevent bear problems. Cut out both ends of tin cans and squash them flat, and box them for empty return flights. Garbage pits are prohibited by the Fish and Wildlife Service on the refuge. Never start fires with fuel. Be sure all burn barrels have proper grates or covers to prevent grass fires from sparks. Garbage at Ilnik and Orzenoi Rivers should be double-bagged and removed via plane or boat.

Transportation

Do not endanger life or property by going out in a boat on dangerously rough water. If you are unfamiliar with Marine Safety, ask the ARB for information or advice. All personnel must wear a life jacket when out on open water. Use your head - if you think it is dangerous, don't go out on the water.

Extra shear pins or propellers and a tool kit which includes pliers, spark plugs, and a spark plug wrench should be in the boat at all times. In case travel at night becomes necessary, carry a flashlight.

Some camps may be furnished with 3-wheel or 4-wheel all terrain vehicles (ATV's). The following safety precautions shall be observed at all times regarding Department ATV's. Only employees of the State may use the vehicles. Non-Fish and Game employees are not allowed on these vehicles at any time. Only one employee may ride on the vehicle at one time. The safety helmet provided must always be worn during operation of an ATV. An ATV may provide transport of State materials, supplies, and equipment between camp sites and supply planes or vessels. In addition, they may be used for transportation to and from assigned duties in the field such as monitoring a fishery or collecting harvest information, etc.

Review the Marine Safety and Light Aircraft Safety Manuals located at all camps before boating or flying. Do not get in a boat or plane if you feel uncomfortable with the situation. Consult the crew leader or pilot beforehand.

Fire and First Aid

Check your camp's fire extinguisher. Know where it is and how to use it! Inventory your camp first aid kit, replace items as needed and become familiar with basic first aid treatment. Review the first aid booklet.

Take pains to avoid intestinal parasites carried by beaver and otter etc. When in doubt, boil your drinking water.

Keep the cabin, surrounding area, and yourself clean and neat. Appearance is important. You will not always be notified of the intended arrival of visitors, officials, etc. Impressions of visitors are often based on appearance.

Rabies is common on the Alaska Peninsula, be careful of all mammals including ground squirrels, fox, wolf, otters, and your pet. If bitten save the head of the animal if possible, wrap the head in several layers of plastic, put in a good box and freeze if possible. Notify your supervisor of the accident immediately. Burn and bury remaining parts of the carcass away from water sources and cabins, take precautions such as wearing plastic gloves to dispose of the carcass. Do not send suspected rabies animals out of your area unless you are bitten, burn and bury the carcass as instructed.

Appearance

Keep the cabin, surrounding area, and yourself clean and neat. Appearance is important even in remote camps. Impressions of visitors (public, visitors, officials, etc.) are often based on personal appearances. Do your best to look respectable and keep the grounds clean.

Compatibility of Field Personnel

If you find yourself unable to get along with other members at your camp, notify the ARB and an attempt will be made to solve the problem. Usually, the person with the most experience in camp will be the crew leader. If it is not clear who has been designated crew leader in your camp ask your supervisor.

APPENDIX D
First Aid and Safety

MEMORANDUM STATE OF ALASKA

To: Catch Sampling Crews 1992 FIELD CAMPS

From: Bob Murphy
Area Research Biologist
Division of Commercial Fisheries
Department of Fish & Game - Kodiak

SUBJECT: Health and Welfare of Crew Members

It is your responsibility to ensure that your crew members are fully aware of health and safety practices (e.g. basic first aid, location of fire extinguishers, etc.). More often than not, these obvious practices are ignored. With camps as they are, neglect of health practices can have serious ramifications if an employee were to become ill.

King Cove and Port Moller have medical clinics. Insurance forms will be available at both locations. Inform the ARB in Port Moller or AMB's in Sand Point or Cold Bay immediately of any illness or injury that will require medical assistance or lost work time.

A State rifle or shotgun will be provided at each camp. You may bring your own firearm if you wish. Loaded guns are prohibited inside the camp facilities. Loaded, meaning a round in the chamber of the gun. Anyone handling a firearm should always treat it as if it were loaded. Guns should be kept clean and oiled and be completely unloaded while being cleaned. Any horseplay with or misuse of firearms while working for the Department of Fish and Game will not be tolerated and will be grounds for immediate dismissal. Completely unload a firearm of all rounds before entering a vessel or airplane. Keep an empty chamber under the firing pin of each pistol to prevent accidental discharge by accidentally dropping the weapon.

Do not antagonize bears - each one is a potential danger. Do not encourage bears to come around camp by leaving food or unburned garbage around. Do not shoot at a bear unless, in your best judgement, he is endangering someone's life or damaging personal or state property. Use your best judgement on whether to shoot a bear if property is at stake. When, and if, trying to frighten a bear away by shooting near it. By chance, you may wound the animal accidentally. If you are having problems with a particular bear around camp, call the ARB or AMB and notify

them of the situation. The Game Division personnel will take care of the problem, if it is feasible.

Port Moller has a 3-wheel and 4-wheel all terrain vehicles (ATV's). The following safety precautions shall be observed at all times regarding Department ATV's. Only employees of the State may use the vehicles. Non-Fish and Game employees are not allowed on these vehicles at any time. The safety helmet provided must always be worn during operation of an ATV. An ATV may provide transport of State materials, supplies, and equipment between camp sites and supply planes or vessels. In addition, they may be used for transportation to and from assigned duties in the field such as monitoring a fishery or collecting harvest information, etc.

Check your camp's fire extinguisher. Know where it is and how to use it! Inventory your camp first aid kit, replace items as needed and become familiar with basic first aid treatment. Review the first aid booklet.

Keep the cabin, surrounding area, and yourself clean and neat. Appearance is important. You will not always be notified of the intended arrival of visitors, officials, etc. Impressions of visitors are often based on appearance.

Rabies is common on the Alaska Peninsula, be careful of all mammals including ground squirrels, fox, wolf, otters, and your pet. If bitten save the head of the animal if possible, wrap the head in several layers of plastic, put in a good box and freeze if possible. Notify your supervisor of the accident immediately. Burn and bury remaining parts of the carcass away from water sources and cabins, take precautions such as wearing plastic gloves to dispose of the carcass. Do not send suspected rabies animals out of your area unless you are bitten.

FIELD MANUAL

ALASKA PENINSULA SALMON ESCAPEMENT

SAMPLING PROCEDURES, 1992

By:

Robert L. Murphy

Area Research Biologist

Alaska Department of Fish and Game
Division of Commercial Fisheries
211 Mission Road
Kodiak, Alaska 99615

May 1992

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INTRODUCTION

The basic function of fisheries management is to allow effort on stocks with a harvestable surplus while protecting returning stocks with runs not meeting the minimum escapement requirements.

In 1993, weirs at Bear River, Nelson River, Orzenoi Lake, and Ilnik Lagoon will enumerate and sample the escapement. Field camps at Middle Lagoon and Thin Point Lake will estimate the escapement and sample fish from the commercial or subsistence catch if needed.

OBJECTIVES

Long Term: To improve management of the salmon resources for the Alaska Peninsula and Aleutian Islands Management Areas through improved forecasting, development of stock-recruitment relationships to assess escapement requirements, and accurate assessment of stock composition.

Short Term:

1. Determine salmon escapement by species.

2. Determine the sockeye salmon age, length, and sex composition for the major systems within standard levels of precision.

3. Determine the age, length, and weight composition of sockeye smolt for the Bear River within standard levels of precision.

SUPERVISION

The Area Management Biologist (AMB) in Cold Bay, Arnie Shaul, will supervise the Middle Lagoon, Nelson Lagoon, and Thin Point projects. The Area Management Biologist in Sand Point, Jim McCullough, will supervise the Orzenoi River project. The Area Research Biologist (ARB) in Port Moller, Bob Murphy, will directly supervise the Bear River and Ilnik Lagoon crews. The Area Research Biologist will instruct the sampling crews on the proper techniques and procedures, and visit the camps, if possible, to insure sampling is being conducted properly.

PERSONNEL

ADF&G will staff Bear River from about 27 May through 1 September, Nelson River from 1 June through 31 July, Orzenoi River from June 10 through August 10, and Ilnik Lagoon from 15 May through 15 July. The personnel assigned to these projects are responsible for enumerating the adult run and sampling adult and smolt salmon (Bear River). Two people will be assigned to each project; additional assistance, if needed, will be provided.

PROCEDURES

Escapement Enumeration

Bear River

The 1992 weir will be placed in the location where the 1991 weir was located. After the wooden tripods are in place, the tripod tables should be loaded with sand bags. After the stringers, pickets and catwalk are in place, sand bags should be stacked from the catwalk to the top of the tripod against the back legs of the tripod.

After the weir is fully operational, the counting tower should be made ready in case the weir washes out. The counting panels should be readily avaialable and repainted if needed. Counting procedures, in an emergency, for Bear River tower would be the same as those described for Nelson River tower.

The main objective of the Bear River weir project is to record the number of salmon escaping into Bear Lake. Large numbers of fish (> 200) should not be allowed to stage behind the weir. If large numbers of fish (> 200) start to accumulate behind the weir, open up the weir and count them through.

Use two tally whackers while counting sockeye adults and sockeye jacks. Any sockeye salmon under 16 inches (400 mm) in length (mm; mid eye to tail fork) will be considered a jack. Use the counting form provided to record the data (Table 1). On the weir forms, note the time of day, amount of time the gate is opened to pass fish, and the number of fish by species passed each time the gate is open. Cumulative daily counts and cumulative seasonal counts for each species will be relayed to the Area Research

Table 1. Nelson and Bear Rivers, Ilnik Lagoon, and Orzenoi escapement reporting form.

Date: Time Period	Daily Sockeye				Daily Other		Remarks: weather, number of fish sampled, water level, holes in weir, etc.
	Adult		Jack				
	Period	Cumulative	Period	Cumulative	Period	Cumulative	

	Sockeye Daily Total	Sockeye Cumulative	Daily Other	Cumulative Other
Total	Adult	Adult	Chinook Chum	Chinook Chum
	Jacks	Jacks	Pink Coho	Pink Coho

Note: Do not lump other species, separate by species.
If another form is needed for one day, please make note that there are 2 pages at the top of each form.

Biologist in Port Moller during normal radio schedules. When the project is completed send all forms to Port Moller.

Make note of other species and individually count them.

Weir maintenance is very important to prevent weir washout. Keep the weir clean of debris and check the river substrate as often as possible to make sure no escape holes do not occur. If the weir cannot be used for some reason, the tower should be used.

Nelson River Weir

The Nelson River weir will be manned from about 1 June through 31 July. The weir should be fish tight before salmon arrive (about mid-June).

After the weir is fully operational, the counting tower should be made ready in case the weir fails. The counting panels should be repainted annually and installed on the river bottom in the same location as in past years.

On the weir forms note the time of day, amount of time the gate is opened to pass fish, and the number of fish by species passed each time the gate is open. Cumulative daily counts and cumulative seasonal counts for each species will be relayed to the Area Management Biologist (AMB) during normal radio schedules. When the project is completed send all forms to the AMB.

The main objective of the Nelson River weir is to record the number of salmon escaping into the Hoodoo Lake-Sapsuk River. Large numbers of fish (> 200) should not be allowed to stay behind the weir. If fish start to accumulate behind the weir, open up a fish gate and count them through.

Two to four tally whackers may be necessary for counting sockeye adults, chum salmon, chinook, and coho salmon. Any sockeye salmon under 400 mm in length (mm; mid eye to tail fork) will be considered a jack. Use the counting form provided to record all data.

As with Bear River, weir maintenance is important. Keep the weir clean of debris and check to insure the weir is fish tight. If the weir cannot be used, the tower and the procedures for the Nelson River Tower will be utilized.

Nelson River Tower

The Nelson River tower will be used if the weir is not operational. The first task will be to install the weir and paint and install the counting panels. Logbooks are provided for recording daily and cumulative count data.

Counting Procedures are as follows:

Hour One: Counts are made during the first 10 minutes and last 10 minutes of the hour. The counts are added together and multiplied by 3 to obtain the hour one estimate.

Hour Two: No actual counts are made. The count is estimated by adding the last count in hour one to the first count in hour three and multiplying by 3.

Hour Three: Counts are made during the first 10 minutes and last 10 minutes of the hour. The counts are added together and multiplied by 3 to obtain the hour three estimate. The same procedure as during hour one.

Hour Four: No actual counts are made. The count is estimated by adding the last count in hour three to the first count in hour five and multiplying by 3.

This procedure is repeated throughout the balance of the day until the last count. Due to poor visibility, caused by darkness during the end of the last hour, two 10 minute counts are made at the beginning of the hour. The first 10 minute count is used along with the last 10 minute count prior to the previous hour to calculate the previous hours count. To calculate the last hour's count, add the two 10 minute counts together and multiply by 3.

The night count estimate is made by averaging the last hourly count of day A with the first hourly count of day B, and multiplying the average by the number of night hours.

Calculate daily escapement and escapement when reporting counts over the radio. Calculations should be re-checked for errors.

Ilnik Lagoon

The Ilnik Lagoon weir will be staffed from about 15 May through 15 July. The 1992 weir will be placed, in the same location as in 1991, about 1 mile below the village. The cable is already installed across the river along the river bottom. The cable is attached to deadheads and bulkheads located on each bank and winched tight. Plywood will be attached to the cable and run parallel with the current. The purpose of the plywood is to act as a firm substrate for the tripods to rest. The tripods should be loaded with sand bags. After the stringers, pickets and catwalk are in place, sand bags should be stacked on top of the tripod against the back legs.

The main objective of the Ilnik Lagoon weir project is to record the number of salmon escaping into Ilnik River and Lake. Large numbers of fish (> 200) should not be allowed to stage behind the weir. If fish start to accumulate behind the weir, open up the weir and count them through.

Weir maintenance is extremely important at Ilnik to decrease the resistance on the weir. Due to the tidal influence, a large amount of debris tends to accumulate on the pickets. Keep the weir clean of debris and check it as often as needed to insure there are no holes for fish to escape. In the deeper channels, a dry suit will be needed to visually inspect the weir to make certain that it is fish tight.

Cumulative daily counts and cumulative seasonal counts for each species will be relayed to the Area Research Biologist in Port Moller during normal radio schedules. When the project is completed send all forms to Port Moller.

Orzenoi (Orzinski) Lake

The Orzenoi Lake project will be supervised by the Sand Point Area Management Biologist (Jim McCullough). Basic duties will those described in the the previous weir projects. Cumulative and daily

counts should be relayed to the Area Management Biologist in Sand Point. All forms should be sent to Sand Point and then forwarded to Port Moller.

Middle Lagoon, and Thin Point Projects

Activities for the Middle Lagoon and Thin Point projects will be supervised by the Cold Bay Area Management Biologist (Arnie Shaul).

Escapement sampling for age, length, and sex composition

Bear, Nelson, and Orzenoi Rivers and Ilnik Lagoon

Escapement sampling will be conducted by the crews stationed at Bear, Nelson, and Orzenoi Rivers and Ilnik Lagoon. Sockeye salmon will be the primary species sampled. Samples will be collected at all weirs using the weir live box trap. If the weir washes out, samples will be seined. The ARB will attempt to visit each camp on the North Peninsula early in the season to make sure scales are being worked up properly, while Jim McCullough will be responsible for the quality control of Orzenoi. Appendix A describes sampling and recording procedures.

The sample goal is 240 adult fish per week per species. A week is the standard Sunday to Saturday. Sampling should begin on Monday and be completed that day, if possible. If it is not completed, subsequent days should be sampled to obtain the 240 fish sample. If this cannot be done, continue to collect samples on subsequent days until the goal is reached or the week terminates.

Smolt Sampling

Out-migrating sockeye smolt will be collected at Bear Lake. After the weir is operational, sampling will begin. A weekly sample size of 200 smolt will be collected during the duration of the smolt out-migration, which will probably last 4 to 6 weeks. Smolt will be sampled for age, weight, and length

composition. Appendix B gives sampling and recording procedures. Sampling will begin on Tuesday, the third day of the week, so as not to interfere with adult sampling. Estimate the peak migration, and note if the migration is relatively light, moderate, or heavy.

A fyke net will be located behind the weir near the center of the river, so the water velocity is just below the washout threshold of the net. A good procedure is to attach the net behind the weir using the tripods as a support for the net. The net will be fished as long as it is necessary to capture 200 smolt. Near dusk is when out-migration usually peaks. If 200 smolt are not captured on Tuesday, sampling will continue until the goal is met or the week terminates. Check the net frequently to avoid unnecessary mortality.

It is important to fill out the backs of the AWL forms when weights are recorded. The numbers on the front left-hand margin need to be copied to the back left-hand margin when weights are recorded on the back of the form.

General Camp Maintenance and Procedures

During the season, the duties outlined above may take longer than 37.5 hours/week to accomplish. When this happens at Bear River or Ilnik Lagoon, notify Bob Murphy, at Nelson River notify Arnie Shaul, and at Orzenoi River notify Jim McCullough. They will decide what projects take priority and whether or not to authorize overtime. No additional overtime may be worked or claimed unless it is first authorized.

Cabin and facilities maintenance is an important aspect of being able to accomplish objectives comfortably. Maintenance can usually be accomplished during slow periods of the season. As soon as the camp is established, look the situation over and make a list of projects that need to be accomplished. Send in a list of materials needed for these jobs. Also, try to anticipate problems before they occur. Ordering replacement parts, before a deteriorating piece of equipment actually breaks, will prevent long delays in repair due to the logistics involved.

Appendix C provides general information including radio schedules, ordering food and supplies, compliance with ADF&G regulations, equipment/maintenance, procedures regarding violations,

emergencies, firearms, bears, garbage, boating, fire and first aid safety, drinking water, personal gear and pets, compatibility of field personnel, and cleanliness of cabin.

DATA REPORTING

Prior to June 1, 1993 the ARB will author a Regional Information Report and Technical Fisheries Report which covers the results of the 1992 escapement sampling season. Prior to 1 June 1993 the Area Management Biologists will author an Annual Management Report which covers the results of the 1992 season.

APPENDIX A

Scale Sampling Techniques

ALASKA PENINSULA SCALE SAMPLING TECHNIQUE

The following is an explanation of how salmon scale samples are taken. If you have not taken scales before or if you have any questions ask somebody who has had experience with scale sampling. Scales must be readable to be useful, so follow proper technique when sampling.

Important Points to Remember

Gum Cards

A scale card is a gum-backed sheet numbered 1 through 40. Samples are placed on the cards with no attempt to separate the fish by their sex.

It is important to keep the gum card dry at all times. If weather does not allow you to do this, it is best to suspend sampling until dryer conditions exist. A wet gum card is useless as the scales will fall off and prevent a readable impression from being taken.

A new scale card is started for each day. Even if a card is not filled, a new card is still to be started for each day. Also, a different card is to be used for each location, i.e. Bear River versus Nelson River. It is important that scale cards and numbers match the corresponding AWL sheet.

Scales:

1. Clean the scale by wetting it and rubbing it between your fingers. Make sure no dirt, slime, and skin (no silver color) remains on the scale.

2. Mount the scale on the gum card with the ridged side up. The ridged side is the same side that is exposed on the salmon.

3. One scale will be taken from sockeye and chum salmon. Three scales will be taken from chinook salmon and four from coho salmon.

4. Take the preferred scale if it is available, if they are not available, take a scale in an area close to the preferred area, but note that it is not preferred.

5. Scales should be neat, clean, and orderly.

Age-Weight-Length (AWL) Sampling Form

Age - Scale samples are needed to age the fish.
Weight - Recorded to the nearest tenth of a pound on any adult fish not being returned live to the water.
Length - Recorded to the nearest millimeter from the mid-eye point to the fork in the tail.

Fill in all information on the AWL form.
Each AWL form must match up with the appropriate scale card.

Length, Sex, and Scale Sampling Procedure for Sampling: Using Mark-Sense Forms

Salmon from the catch are sampled for length, sex, and age annually by field crews throughout the state. This data base is essential to sound management of the States' salmon resources. This information is drawn upon by management and research biologists for: (1) forecasting run strengths; (2) setting escapement goals; (3) examining the productivity of aquatic systems; (4) salmon growth analysis; (5) catch apportionment (based on age composition and/or scale pattern analysis); (6) in-season run estimation; and (7) to gain a better understanding of the biology of each stock.

For clarification purposes a SCALE SAMPLE and SUB-SAMPLE will be defined as follows:

SCALE SAMPLE: A data set collected from a specific sampling location, containing scales and data from a single species, collected during a single year. All data forms and scale cards of a single SAMPLE have the same statistical code. AWL and scale card number in a sample are consecutively and chronologically ordered.

SUB-SAMPLE: Any portion of a scale sample consisting of consecutively numbered AWL's and scale cards. SUB-SAMPLES usually consist of one or more time segments of a sample.

To be useful, data must be recorded on the mark-sense forms neatly and accurately. The following procedures are to be adhered to when sampling for length, sex, and scales using mark-sense AWL forms.

COMPLETING THE FORMS:

A completed mark-sense AWL form (Appendix A.1) and accompanying gum card for sampling escapement of sockeye and chum salmon are to be completed for each form.

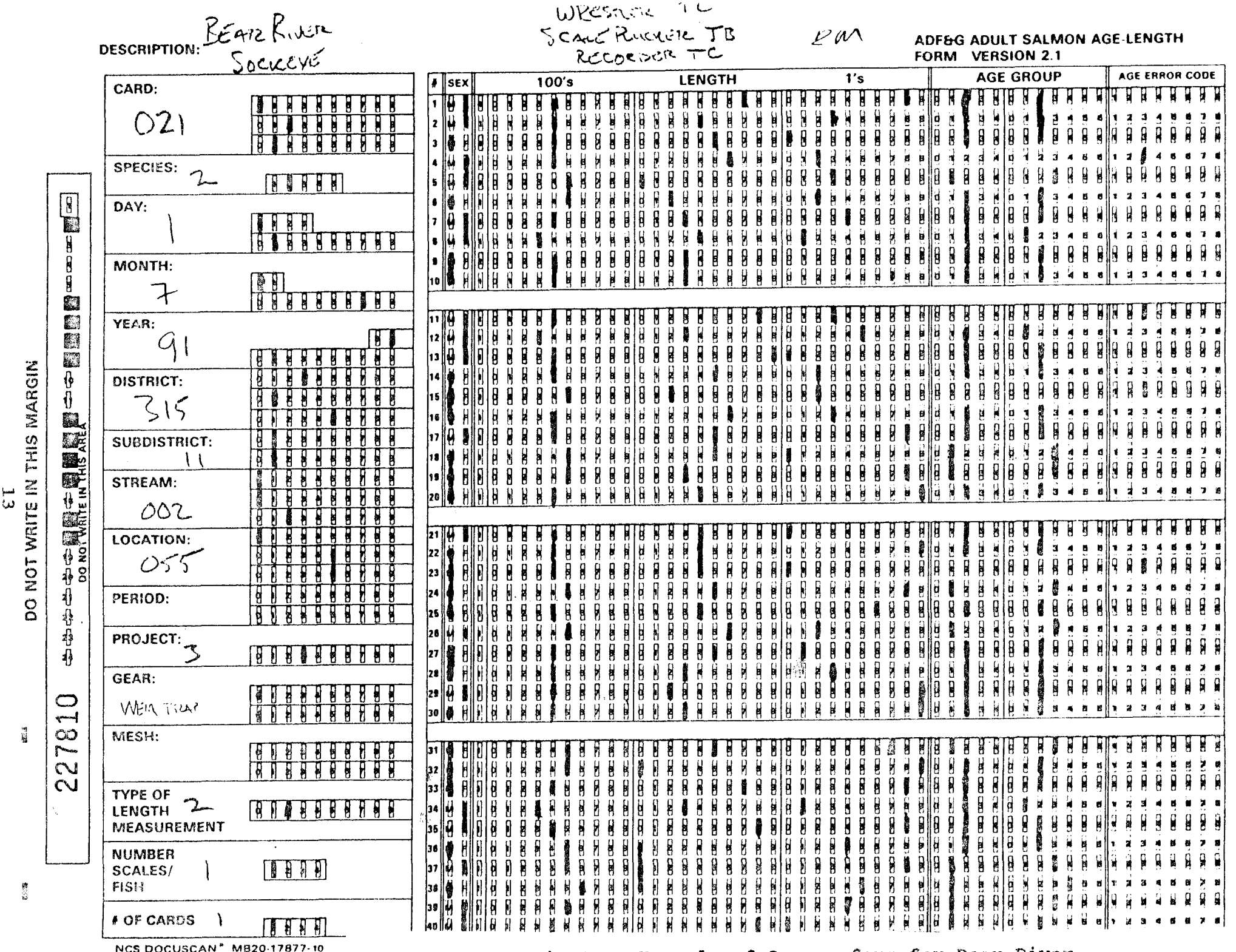
Complete each section of the left side of the mark-sense form using a soft No. 2 pencil and darken the corresponding blocks as shown in the figures. It is imperative that you darken the box completely and neatly. **The number inside the box should be completely darkened.** Make every effort to darken the entire block as partially filled blocks are often missed by the optical scanner which reads and records the data from the mark-sense AWL forms. Label only one form at a time to avoid "the carbon paper effect" and resulting stray marks. It is necessary to review the forms after each day and ensure that all the data is filled in and appropriately marked.

Description: For escapement sampling: Species/Area/Catch or Escapement/gear type i.e. weir/Samplers (W-R-P).

Card: The AWL forms and corresponding gum card(s) are numbered sequentially by date throughout the season starting with 001. A separate numbering sequence will be used for each species, gear type, district, and geographic location. Consult your crew leader for the current card number. Sockeye and chum samples will have only 1 card per AWL form.

Species: Refer to the reverse side of the AWL form for the correct digit. Day, Month, Year: Use appropriate digits for the date the fish are caught.

District: List only one district. Consult the ARB for appropriate district, sub-district, and stream numbers.



Appendix A.1. Example of Opscan form for Bear River.

Subdistrict:

List a single sub-district if it is known and all the fish sampled were from that single sub-district. Leave blank if more than one sub-district is involved or if the subdistrict is unknown.

Stream:

Consult the ARB for appropriate number.

Location:

List the appropriate code as shown in Appendix A.2.

Period:

Leave blank.

Project:

Refer to the reverse side of the AWL form for the correct code.

Gear:

Refer to the reverse side of the AWL form.

Mesh:

Leave blank.

Type of length measurement:

Use mid-eye to fork of tail (Appendix A.3).

# of cards:

Mark 1 when sampling sockeye and chum salmon (Appendix A.1).

It is extremely important to keep the mark-sense forms flat, dry, and clean. Fish slime and water curling will cause data to be misinterpreted by the optical scanning reader machine. If unnecessary pencil marks, dark spots, etc. are visible, they need to be erased or else the machine will misinterpret the mark. It is necessary to completely fill in all information and darken the boxes (if needed) after each day.

Additional data columns are available on the reverse of the AWL for individual project use. If you take weights, you need to transfer the dark boxes on the front left margin of the form to the left margin on the back. This code needs to be exactly as it appears on the front.

GUM CARD(S):

Fill out the gum cards.

Species:

Write out completely (i.e., chinook, sockeye, etc.).

Locality:

For catch sampling, write down area in which fish were caught followed by the word catch (e.e., Herendeen Bay Catch).

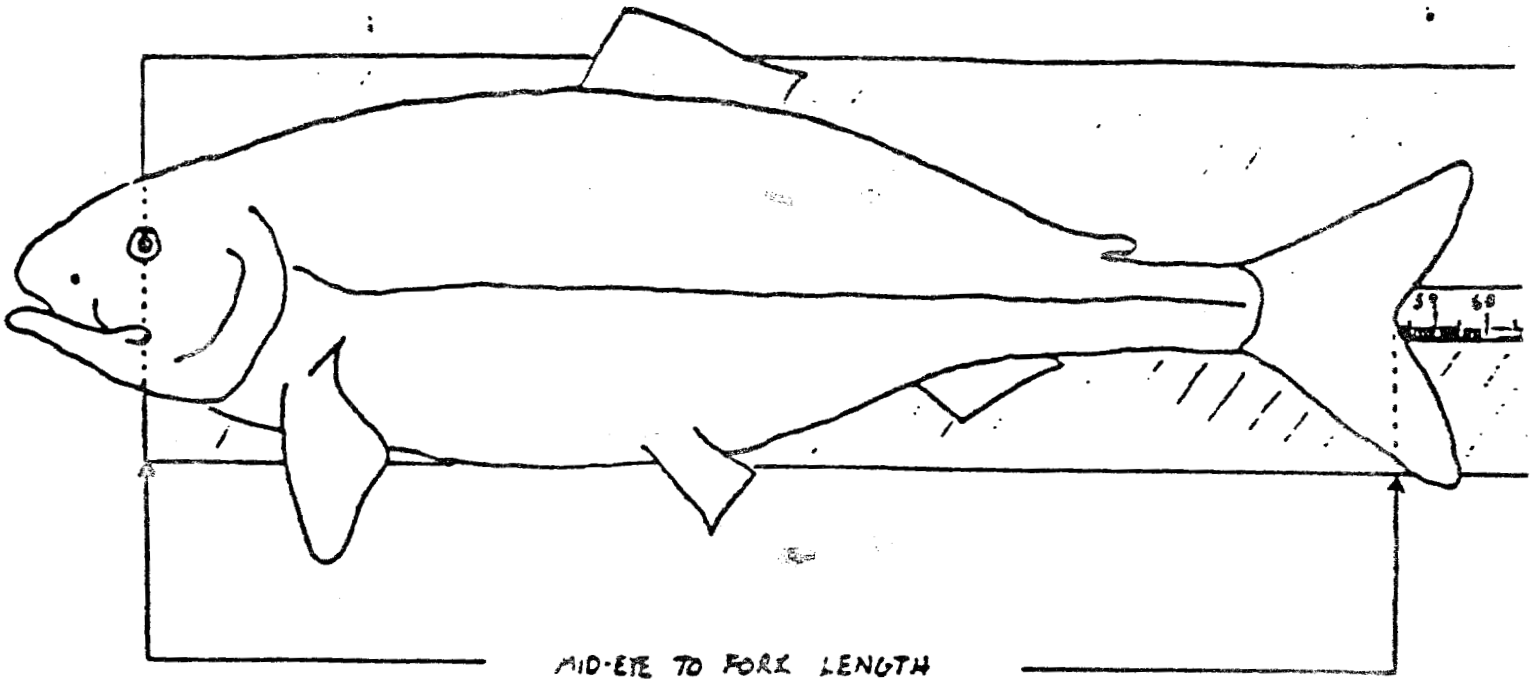
Statistical code and Sampling date:

Transfer the appropriate digits from the AWL form.

Appendix A.2. Assigned port and weir location codes.

150 - King Cove
151 - Port Moller
152 - Dutch Harbor
153 - Akutan
154 - Sand Point
155 - Bear River, ADF&G Camp
156 - Nelson River, ADF&G Camp
157 - Canoe Bay
158 - Ilnik Lagoon
159 - Orzenoi Lake, ADF&G Camp

Appendix A.3. Measuring fish length.



Because the length and form of the snout of salmon changes as the fish approaches sexual maturity, length measurements are made from the middle of the eye to the fork of the tail. The length is always recorded to the nearest millimeters. The procedure for measuring length (mid-eye to fork) of the salmon is as follows:

1. Place the salmon flat on the board with the head to your left and the dorsal fin away from you.

2. Make sure your eye is directly over the end of the board. Line the eye of the salmon up with the edge of the board and hold the head in place with your left hand. It helps to place a finger in the salmon's eye for reference.

3. Flatten and spread the tail against the board with your right hand.

4. Read the mid-eye to fork length to the nearest five millimeters.

Gear:
Write out completely.

Collector(s):
Record the last name or initials of the person(s) sampling.

Remarks:
Record any pertinent information. Transfer this same information to the top margin of the AWL.

SAMPLING:

A. GENERAL

1. Sex the fish and darken M or F in the sex columns. If any difficulty was encountered in this procedure, write "I had trouble sexing these fish" on the top margin of the AWL and ask your supervisor for help as soon as possible before sexing additional fish.

2. Measure all species length in millimeters from the middle of the eye to the fork of the tail, refer to Appendix A.3. Record length by blackening the appropriate column blocks on the AWL form. Column 3 on the AWL form is used for fish over 999 millimeters long. Measure all species of salmon to the nearest mm. Check the calipers daily before use to ensure the accuracy of the measurements.

3. Pluck the "preferred scale" from the fish using forceps (Appendix A.4). Remove all slime, grit, and skin from the scale by moistening and rubbing between fingers. The "preferred scale" is located on the left side of the fish, two rows above the lateral line on the diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. If the "preferred scales" are missing, select another fish.

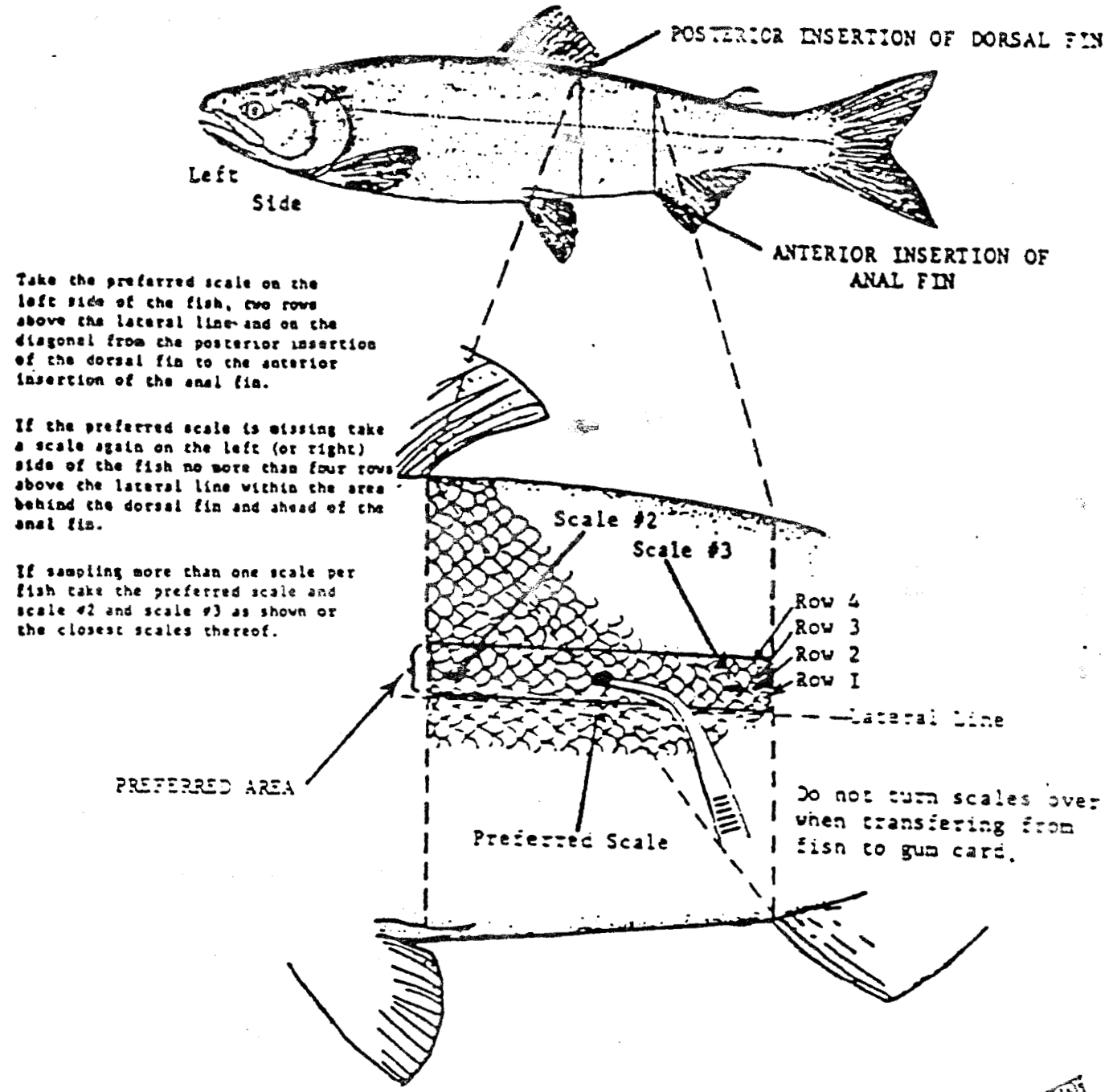
4. Clean, moisten and mount scale on gum card directly over number 1. The side of the scale facing up on the gum card is the same as the side facing up when it was adhered to the fish. The exposed facing side is referred to as the "sculptured" side of the scale. The ridges on this sculpture side can be felt with a fingernail or forceps. Mount scale with anterior end oriented toward top of gum card.

5. When sampling sockeye and chum salmon repeat steps 1 through 4 for up to 40 fish on each AWL form.

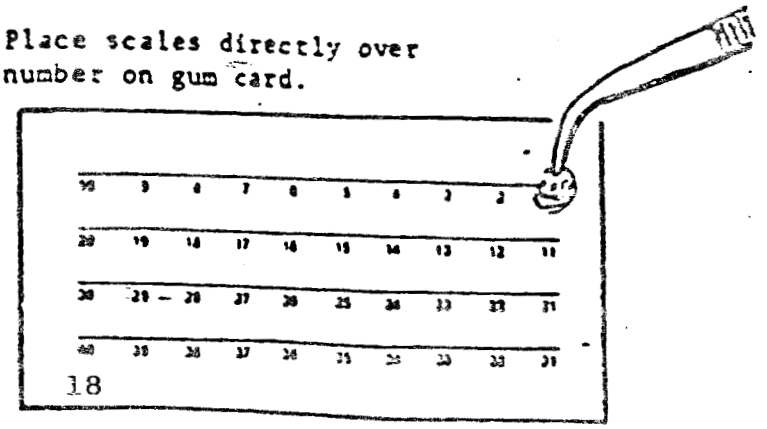
6. Use plastic scale card holders to hold individual scale cards during sampling and cover the completed gum card with wax paper for storage.

7. When sampling at a weir, you may use the old AWL forms or field notebook to record the data. Keep the mark-sense forms in camp where they will be clean, dry, and flat. After sampling is done for the day transfer the data to the mark-sense forms on a daily basis. It is the responsibility of the data collector to transcribe the data before turning it over to the ARB.

Appendix A.4. Preferred scale sampling area on an adult salmon.



NOTE: Mount scales with anterior portion of scale oriented toward top of card.



8. Miscellaneous:

   a. When scales are sampled in wet conditions it is difficult to mount scales in a fashion so as to result in a good scale impression being made. Glue often obscures scale features and scales frequently adhere poorly to the card. Try to keep all the paperwork dry during this time. If the gum card does get wet, the scales should be remounted.

   b. For adipose clipped fish record the head tag number on the corresponding row in the first five columns on the reverse side of the AWL.

   c. Look down the form from two angles after the data has been recorded to pick up any glaring mistakes. A common error occurs, for instance, in placing both the 4 and 7 of a 475 mm fish in the 100's column with nothing in the 10's column.

   d. Keep all fish slime off forms and erase any stray marks on the forms before turning them in to your supervisor.

   e. Write in all comments explicitly and completely under remarks, transfer remarks to top margin of AWL.

   f. Responsibility for accuracy lies first with the primary data collector(s). The port supervisor will return sloppy or incomplete data to individual collectors. After editing a form, place your initials next to card #, but not in left margin. Editing these forms will save valuable time for the ARB during the winter, and is an extremely important part of your job duties.

9. As soon as possible after completion send the samples and mark-sense forms to the ARB in Port Moller. During scheduled radio calls before and following the sending of data to the ARB, the crew leader will notify the ARB: (1) that the data is being mailed (use a moisture-proof container); (2) what data is being sent; (3) when delivery is expected in Port Moller; and (4) who is transporting the data. It is important that these steps are followed to ensure delivery.

SCALE SAMPLING CHECKLIST

Clipboard	Pencils (No.2)	Gloves
Gum Cards	Forceps	Measuring board or calipers
AWL's	Wax paper inserts	Sampling Manual
		Plastic scale card holders

Some Reminders

1. For greater efficiency in scale reading and digitizing, mount scales with anterior end toward top of scale card.

2. AWL's should be carefully edited before submitting to ARB. This is extremely important, and cannot be emphasized enough. Re-check header information on AWL's; make sure all available information is filled in. Take extra care to use the catch date and not sample date. Page numbers should not be repeated; a frequent error is to begin a week's sample with the last page

number used the week before. This is particularly important if the data regularly is sent to town; it is easy to forget which numbers were used. Crew leaders should take time to ensure that the boxes are being blackened correctly, if the boxes are not darkened properly or sloppily marked the optical scanner records the information incorrectly or misses it entirely. Keep marks within each rectangle and completely fill them. Do not go outside the rectangle. After the AWL's are edited, place editor's initial next to page number, but not in left margin.

3. Transfer important comments from scale cards to AWL's. After pressing scales, the cards are seldom referred to again, and important remarks can be lost. Write comments in the top margin (not on the left side) or on the reverse of the AWL. If no room is available on the AWL to completely explain the remarks, use a separate piece of paper.

4. Never put data from different dates on one AWL or one scale card. Even if only one scale is collected that day, begin a new card and AWL for the next day.

5. If weights are requested to be taken, they may be noted in the right margin of the AWL during sampling, but be sure to transfer the weights to the appropriate columns on the reverse of the AWL before submitting it to the ARB, and darken in the code from the left margin of to the back of the form.

6. The data processing program uses the "litho code" on the AWL. (It is located in the lower left margin of the AWL.) It helps if the AWL's are used in the order of this code. It should not be hard to keep them in order if they are arranged that way before page numbering. Those who sample different areas throughout the season can arrange the litho codes in order before each sample is taken.

7. If AWL's get wrinkled or blotched they should be copied over before submitting to the ARB. The optical scanning machine is extremely sensitive to wrinkles and blotches and will misread or reject the sheets.

APPENDIX B

Procedure for Sampling Salmon Smolt

Once the field camp is established, sockeye smolt will be sampled for length, weight, and age data on a weekly basis during the peak outmigration. Smolt sampling will terminate when less than 10 smolt are captured over a 24 hour period, and after consulting with the ARB in Port Moller.

Two hundred smolt will be sampled per week. When more than 200 smolt are captured in the fyke net, place the smolt in a large container and gently stir the smolt. Randomly remove a portion of the catch and sample. Stop this procedure when 200 smolt are sampled. Return the remaining smolt back to the river.

Smolt will be worked up the day following capture. A smolt sampling day encompasses the 24 hours between noon of one day to noon of the following day, and is identified by the calendar date corresponding to the first 12 hour period. Age, weight, and length data will be recorded on adult AWL forms (Appendix B.1). Refer to Appendix B.1 of the standard procedures for recording data on AWL forms. Record at the top of each form: personnel collecting the data, length of time the gear was fished (in hours), the hours from/to the gear was fished, approximate numbers of sockeye smolt and other species captured.

Use a knife to remove 5-10 scales from the preferred area (Appendix B.2). Mount the scales on a glass slide (Appendix B.3). Label the left portion of the slide with: location, date, specimen number, and collectors.

Measure smolt length from the tip of the snout to the fork of the tail, in the nearest millimeter (Appendix B.4).

Blot excess water from the smolt with a paper towel before weighing. Weights will be recorded to the nearest gram.

DESCRIPTION: Bear Lake Sockeye - Smolt

W: KD
P: JF
R: RB

ADF&G ADULT SALMON AGE-LENGTH FORM VERSION 2.1

CARD: 001

SPECIES: 2

DAY: 06

MONTH: 07

YEAR: 92

DISTRICT: 315

SUBDISTRICT: 11

STREAM: 002

LOCATION: 055

PERIOD:

PROJECT: 3

GEAR: Weir trap

MESH:

TYPE OF LENGTH MEASUREMENT 1

NUMBER SCALES/ FISH 1

OF CARDS 1

#	SEX	LENGTH 100's	LENGTH 1's	AGE GROUP	AGE ERROR CODE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
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36					
37					
38					
39					
40					

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS AREA

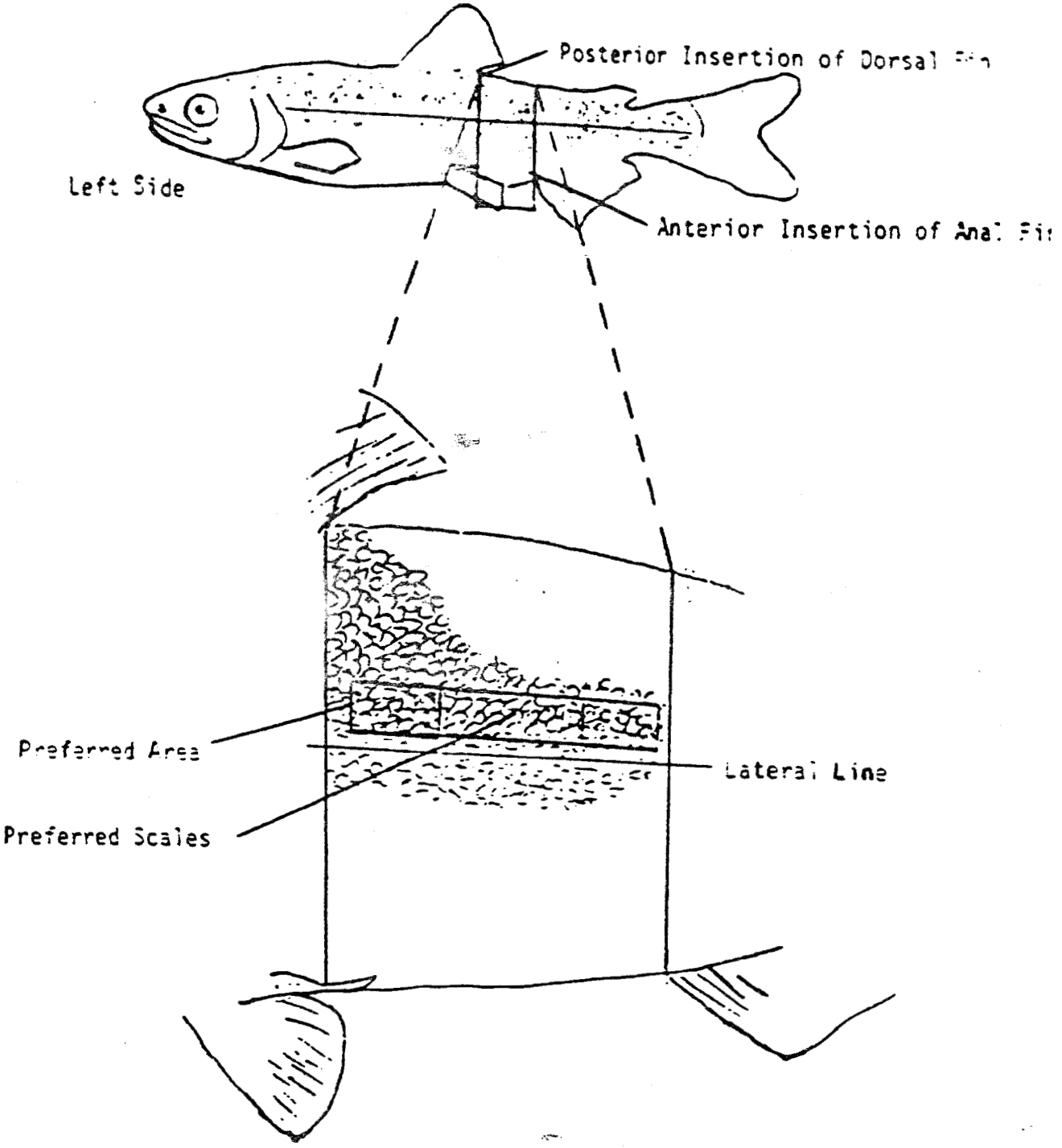
234146

23

NCS DOCUSCAN* M

Appendix B.1. Example of Opscan form for the Bear River smolt.

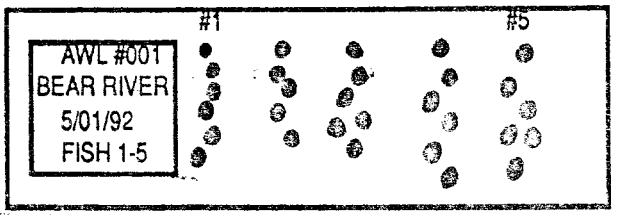
Appendix B.2. Preferred scale sampling area on a smolt salmon.



Appendix B.3 Salmon smolt glass slide example.

The following information should be legibly written on the slide label:

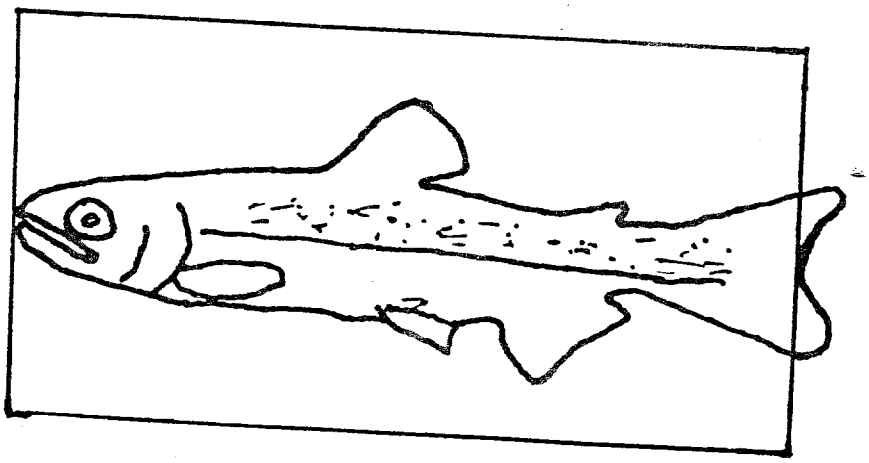
1. AWL #
2. Location
3. date (mo/day/yr)
4. Fish # (1-5, 6-10, etc.)



When the slides are completed, return them to the box in order by AWL #, date, and fish #. Label the slide box on top with the following information:

LOCATION (BEAR RIVER)
AWL NUMBERS (AWL # 001 - 010)
BEGINNING AND ENDING DATES (5/01 - 5/06/92)

Appendix B.4. Measuring smolt length.



APPENDIX C

General Equipment, Camp Maintenance
and Camp Policy

Equipment Maintenance

Equipment maintenance is perhaps one of the most important operations you will perform during the field season. The outboard motors and generators must be kept in good operating condition.

It will be the crew leader's responsibility to assign the most knowledgeable member of the crew to the job of maintaining and servicing the equipment. It will be this persons responsibility to see that all equipment is kept in operating condition.

Outboard Motors

Your outboard motor will perform longer and give less trouble if these suggestions are followed:

1. The correct outboard fuel mixture is 50:1. Always pour the oil into the tank first, then add 2 or 3 gallons of gas and mix thoroughly, then fill tank to capacity always using a large funnel and chamois filter.

2. Chain saws have a fuel mixture 25:1. Chain saw gas should be mixed in a 5 gallon can and clearly marked that it is chain saw fuel.

3. When mixing gasoline or filling the tanks of the generator, stove or lantern, keep the following in mind:

   a. Always mix fuel tanks or equipment under cover to prevent water contamination and always use a funnel and filter.

   b. Fill camp stoves and lanterns outside as the danger of fire is very real.

   c. A little extra effort toward cleanliness will pay in hours of trouble free operation.

4. Always place outboard motors in neutral when starting.

5. Check daily the clamp screws that hold the outboard to the transom. Also routinely check the motor for loose screws and bolts, cracks, and breaks, especially in the area of the lower unit.

6. Never start or run an outboard in the tilted position.

7. In the normal operation of a water pump, a "tell-tale" stream of water is discharged from a hole in the bottom edge of the cowling or from the back of the shaft. If this stream of water stops, the water pump is not working and the motor should be shut off. The side plate over the water intake can be removed for temporary relief as it may be plugged. If the pump continues not to function, the outboard should not be run, and a report to base camp should be made.

8. Check the grease in the lower unit of the outboards propeller once a week, and drain and replace the lower unit grease every three weeks. Jet units must be greased daily. This is crucial. Special grease guns will be provided.

9. If the skeg or jet unit hits bottom, check the screws for tightness and housing damage.

10. If your outboard will not start, check the following:

a. Check to see if the fuel line is connected to the motor and the tank and not pinched or kinked.

b. Check to see if there is water in the gasoline.

c. Check to see if the engine is flooded.

d. Check the spark plugs as they may be fouled or defective (replace if needed).

11. All outboards are to be tilted in the up position when moored stations to preclude silt accumulation in the jet unit or water pump and skag or housing damage.

It should be emphasized that the salmon enumeration counts and sampling must continue, as they are very important to the program.

Boats

1. Boats are to be kept clean and free of loose tools and debris, and moored at locations where they are not subject to damage by wave action or through contact with the river bottom in rock laden areas.

2. Each crew leader will be responsible for maintaining mooring stakes on the river bank sufficient for the boats assigned to his subproject plus one transient craft. Further responsibility includes maintaining a bow line on each assigned craft and ensuring that each boat is properly moored at the end of each work day to preclude possible loss or damage.

Generators

Portable generators may be supplied to field camps. Their maintenance follows the same line as for the outboards. Since some of the generators have 4-cycle engines, mixed gas must not be used. The crankcase oil reservoir should be checked daily and maintained at the full level. After 25 hours of operation the oil should be changed. Spark plugs should be checked after every five (5) hours of operation.

Camp Maintenance

Maintaining a clean and efficient camp site is required. A few of the things to check are:

1. Maintenance of living accommodations and other installations will be performed as necessary. All materials necessary will be provided.

2. Grounds will be kept free of liter. All garbage will be bagged up and disposed of at the nearest sanitary landfill at least once a week. Special precautions should be observed to ensure that garbage does not attract bears and other scavenger species.

3. Upon completion of the summer season, all camp equipment will be cleaned preparatory to winter storage.

4. All sampling nets, tents, and tarps must be dry before being stored.

5. A complete camp inventory will be taken by the crew leader at the close of the field season.

6. All skiffs and ATV's will be chained and locked to a stationary object.

Camp Policy

1. No alcoholic beverages are to be stored in areas open to public view including cook tents. If alcohol is consumed at a camp an employee must be off-duty and under no circumstances shall he or she engage in the operation of any State equipment, including boats and motors nor shall he or she return to duty status under the influence of alcohol.

2. The crew leader of each sampling station shall establish a policy on living standards and personnel behavior in accordance with normal guidelines.

3. All sampling stations will operate as directed. No crew leader shall be off location for more than 24 hours unless specifically authorized by the ARB. Time-off for individual crew members shall be scheduled by the crew leader and shall have the option as to whether sampling duties allow time-off from the location.

4. All employees will be required to act in a professional manner at all times and shall be especially courteous to the public.

5. It will be the responsibility of the crew leader to report any equipment abuse to the ARB and to ensure that abuse does not occur.

   Additionally, the crew leader must also report within 24 hours to the ARB any loss of equipment which occurs.

Food Orders

Grocery orders for Ilnik and Bear Rivers should be placed with Port Moller, Nelson River with Cold Bay, and Orzenoi River with Sand Point during the evening radio schedule.

Personal Gear and Pets

Generally 100 lbs. is a maximum for personal gear. If you anticipate bringing more than that amount to your field camp, check with your supervisor first. Pets are not recommended at remote field camps. Past experience indicates, that one or more of the following problems usually occur:

1. Problem of transportation in small planes for some pets.

2. Who is going to pay for the pet food and who is going to purchase it in town?

3. Some pets attract bears, etc. Dogs will chase a bear until the bear gets mad and then when the bear goes for the dog, the dog will run to his owner or the cabin.

4. Your pet may not be compatible with the other members of your camp and may interfere with work.

5. A pet that gets sick or injured can cause you considerable expense if it must be brought back to town.

6. Rabies is common on the Alaska Peninsula, be careful of all mammals including ground squirrels, fox, wolf, otters, and your pet. If bitten save the head of the animal if possible, wrap the head in several layers of plastic, put in a good box and freeze if possible. Notify your supervisor of the accident and your supervisor will send you into Anchorage if tests for rabies prove positive. Burn and bury remaining parts of the carcass away from water sources and cabins, take precautions such as wearing plastic gloves to dispose of the carcass. Do not send suspected rabies animals out of your area unless you are bitten, burn and bury the carcass as instructed.

Radio Schedules

Radio schedules will be made twice during every day. Radio schedules are normally at 8:45 a.m. and 7:45 p.m. on 3.230 megahertz unless otherwise specified. The morning schedule is used for passing along the current weather (visibility, ceiling, precipitation, etc.) and the previous days escapement counts. The evening schedule are used for updated escapement counts, grocery and supply orders, and the latest pertinent fishery announcements. All camps must complete the schedule within 15 minutes, so we do not invade another areas time allotment. So, keep the conversation short. Personal conversation between camps should be arranged as not to interfere with any ADF&G schedules.

If a camp does not respond to two consecutive radio schedules, the worst will be assumed and a plane will be dispatched. If for some reason you know that you will not be able to make a schedule, notify beforehand either Cold Bay, Sand Point, or Port Moller.

Fish and Wildlife Violations

This is not intended as an inclusive procedure for handling violations, it is not your job. Use this as a guideline for obtaining the necessary information and/or evidence to show and prove that a violation has been committed. It is important to be familiar with the commercial fishing, subsistence fishing, sport fishing, and hunting regulations in your area. Violation procedures are printed on the back cover of the commercial fishing regulation book. Request the regulation book if your camp does not have one.

The use of the 5 W's can greatly aid the Fish & Wildlife Protection officer in obtaining sufficient evidence for a case.

1. What is the violation?
2. When did the violation occur (date, time, tide condition, etc.)
3. Where did the violation occur?
4. Who is in violation and who are witnesses?
5. Why was the violation committed?

It is important that all witnesses to a violation be interviewed and all statements pertaining to a violation be recorded along with their names and addresses. If you have a camera available, pictures are extremely valuable in prosecuting offenders. Collect as much information as possible and contact your supervisor or a State Trooper from the Fish and Wildlife Protection Division immediately. If you do not feel comfortable, or your personal safety may be in danger, do not pursue the violation. Contact your supervisor and they will handle the violation. Be aware that you do not have the power to arrest somebody and never attempt this.

Firearms

A State rifle will be provided at each camp. You may bring your own firearm if you wish. Loaded guns are prohibited inside the camp facilities. Loaded, meaning a round in the chamber of the gun. Anyone handling a firearm should always treat it as if it were loaded. Guns should be kept clean and oiled and be completely unloaded while being cleaned. Any horseplay with or misuse of firearms while working for the Department of Fish and Game will not be tolerated and will be grounds for immediate dismissal. Completely unload a firearm of all rounds before entering a vessel or airplane. Keep an empty chamber under the firing pin of each pistol.

Bears

Do not antagonize bears - each one is a potential danger. Do not encourage bears to come around camp by leaving food or unburned garbage around. Do not shoot at a bear unless, in your best judgement, he is endangering someone's life or damaging personal or state property. Use your best judgement on whether to shoot a bear if property is at stake. When, and if, trying to frighten a bear away by shooting - do not fire toward it. By change, you may wound it by pulling the shot, ricochets, etc. If you are having problems with a particular bear around camp, call the office and notify them of the situation. The Game Division personnel will take care of the problem, if it is feasible.

Garbage

Burn all garbage to prevent bear problems. Cut out both ends of tin cans and squash them flat, and box them for empty return flights. Garbage pits are prohibited by the Fish and Wildlife Service on the refuge. Never start fires with fuel. Be sure all burn barrels have proper grates or covers to prevent grass fires from sparks. Garbage at Ilnik and Orzenoi Rivers should be double-bagged and removed via plane or boat.

Transportation

Do not endanger life or property by going out in a boat on dangerously rough water. If you are unfamiliar with Marine Safety, ask the ARB for information or advice. All personnel must wear a life jacket when out on open water. Use your head - if you think it is dangerous, don't go out on the water.

Extra shear pins or propellers and a tool kit which includes pliers, spark plugs, and a spark plug wrench should be in the boat at all times. In case travel at night becomes necessary, carry a flashlight.

Some camps may be furnished with 3-wheel or 4-wheel all terrain vehicles (ATV's). The following safety precautions shall be observed at all times regarding Department ATV's. Only employees of the State may use the vehicles. Non-Fish and Game employees are not allowed on these vehicles at any time. Only one employee may ride on the vehicle at one time. The safety helmet provided must always be worn during operation of an ATV. An ATV may provide transport of State materials, supplies, and equipment between camp sites and supply planes or vessels. In addition, they may be used for transportation to and from assigned duties in the field such as monitoring a fishery or collecting harvest information, etc.

Review the Marine Safety and Light Aircraft Safety Manuals located at all camps before boating or flying. Do not get in a boat or plane if you feel uncomfortable with the situation. Consult the crew leader or pilot beforehand.

Fire and First Aid

Check your camp's fire extinguisher. Know where it is and how to use it! Inventory your camp first aid kit, replace items as needed and become familiar with basic first aid treatment. Review the first aid booklet.

Take pains to avoid intestinal parasites carried by beaver and otter etc. When in doubt, boil your drinking water.

Keep the cabin, surrounding area, and yourself clean and neat. Appearance is important. You will not always be notified of the intended arrival of visitors, officials, etc. Impressions of visitors are often based on appearance.

Rabies is common on the Alaska Peninsula, be careful of all mammals including ground squirrels, fox, wolf, otters, and your pet. If bitten save the head of the animal if possible, wrap the head in several layers of plastic, put in a good box and freeze if possible. Notify your supervisor of the accident immediately. Burn and bury remaining parts of the carcass away from water sources and cabins, take precautions such as wearing plastic gloves to dispose of the carcass. Do not send suspected rabies animals out of your area unless you are bitten, burn and bury the carcass as instructed.

Appearance

Keep the cabin, surrounding area, and yourself clean and neat. Appearance is important even in remote camps. Impressions of visitors (public, visitors, officials, etc.) are often based on personal appearances. Do your best to look respectable and keep the grounds clean.

Compatibility of Field Personnel

If you find yourself unable to get along with other members at your camp, notify the ARB and an attempt will be made to solve the problem. Usually, the person with the most experience in camp will be the crew leader. If it is not clear who has been designated crew leader in your camp ask your supervisor.

APPENDIX D

Secchi Disk Readings

ADF&G is in the process of evaluating the rearing potential of sockeye systems. A Secchi disk is a simple tool to determine the transparency of the water. The more turbidity (silt, plankton, etc.) in the water, the lower the reading will be. Make sure the disk is clean before lowering it into the water. If the white pies are dirty, they may need to be repainted. Lower the disk into the water until it is no longer visible. It is best to do the readings on the leeward or shaded side of the boat. Wave action and turbulence will diminish your ability to accurately measure the transparency of the water. If possible, calm days are the best for taking measurements. Secchi disk readings provide us with valuable information as to the rearing habitat by euphotic volume.

The transparency usually decreases in the summer when plankton, silk, and organic matter are prevalent. Readings may vary, but will probably be in the 1.0m to 4.0m, as measured by the increments on the line attached to the Secchi disk. The measurement should be read when the disk is no longer visible to the observer. Try to be consistent with the readings (i.e. same observer, similar light and wave conditions, etc.) and take the readings every two weeks in the same locations listed on the map. Use the form provided to record the data and return to the ARB in Port Moller (Appendix D.1.).

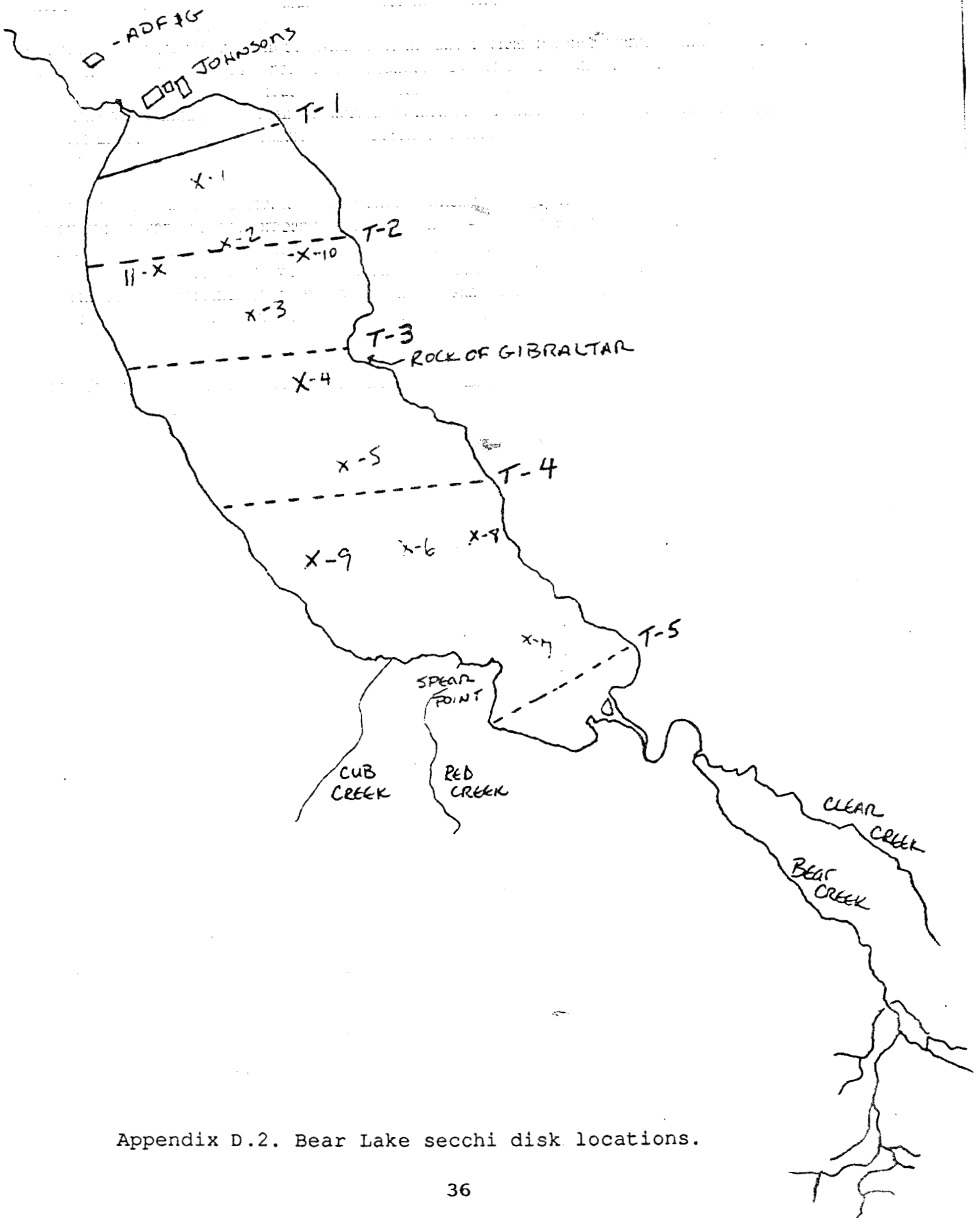
Secchi disk readings will be taken at 11 stations in Bear Lake (Appendix D.2.) and at 8 stations in Orzenoi Lake (Appendix D.3.).

Secchi disk data form

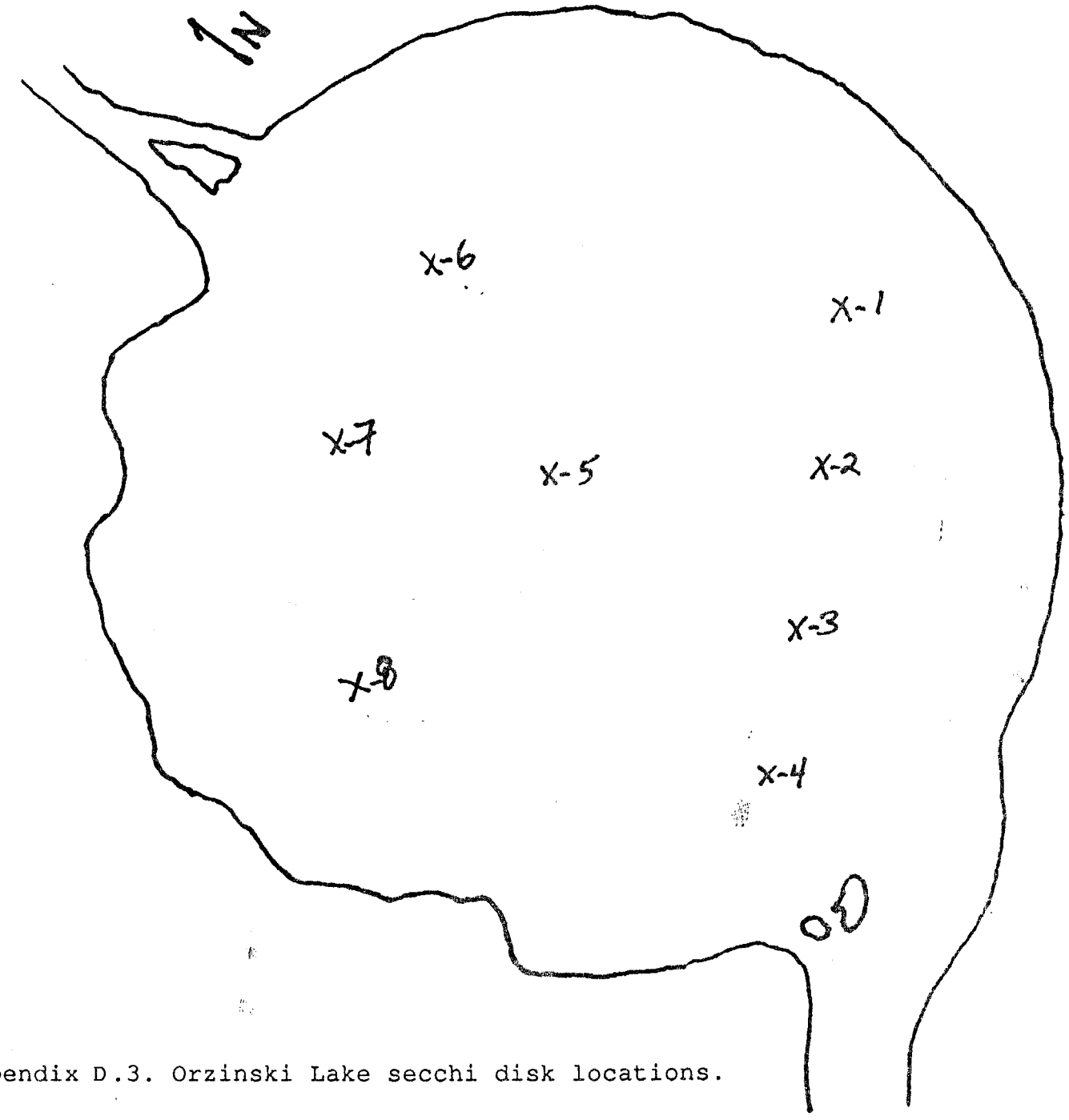
STATION DEPTH IN FEET

DATE	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	Conditions: observers, wind speed and direction, ceiling, visibility, etc.

Appendix D.1. Secchi disk reporting form.



Appendix D.2. Bear Lake secchi disk locations.



Appendix D.3. Orzinski Lake secchi disk locations.